

BULLETIN
OF
AUBURN UNIVERSITY



A LAND-GRANT UNIVERSITY

CATALOG NUMBER 1976-77

AUBURN, ALABAMA

APRIL 1976



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Board of Trustees

UNDER THE ORGANIC and statutory laws of Alabama, Auburn University is governed by a Board of Trustees consisting of one member from each congressional district, as these districts were constituted on January 1, 1961, an extra member from the congressional district in which the institution is located, and the Governor and State Superintendent of Education, who are members *ex officio*. The Governor is Chairman. Members of the Board of Trustees are appointed by the Governor by and with the advice and consent of the State Senate and hold office for terms of twelve years. Members of the board receive no compensation. Trustees serve until reappointed or their successors are named. By executive order of the Governor in 1971, a non-voting student representative, selected by the Student Senate, serves as a member *ex officio*.

The Board of Trustees places administrative authority and responsibility in the hands of an administrative officer at Auburn University. The institution is grouped for administrative purposes into divisions, schools, and departments.

MEMBERS EX OFFICIO

GEORGE C. WALLACE, Governor of Alabama, <i>Chairman</i>	Montgomery
WAYNE TEAGUE, State Superintendent of Education	Montgomery
Student Body Representative, non-voting	Main Campus
Student Body Representative, non-voting Auburn University at Montgomery	

APPOINTED MEMBERS

TERMS ENDING IN 1979

WILLIAM NICHOLS, Sylacauga, Fourth Congressional District
SUE FINCHER, Wetumpka, Fifth Congressional District
WALSTON HESTER, Russellville, Seventh Congressional District

TERMS ENDING IN 1983

R.C. BAMBERG, *Vice Chairman*, Uniontown, Sixth Congressional District
CHARLES M. SMITH, III, Montgomery, Second Congressional District
ROBERT H. HARRIS, Decatur, Eighth Congressional District

TERMS ENDING IN 1987

JOHN W. PACE, III, Mobile, First Congressional District
HENRY B. STEAGALL, II, Ozark, Third Congressional District
J. RALPH JORDAN, Auburn, Third Congressional District
FRANK P. SAMFORD, JR., Birmingham, Ninth Congressional District

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President

BEN T. LANHAM, JR., B.S., M.S., PH.D.
Vice President for Administration

TAYLOR D. LITTLETON, B.S., M.A., PH.D.
Vice President for Academic Affairs

CHESTER C. CARROLL, B.S.E.E., M.S.E.E., PH.D.
Vice President for Research

GENE A. BRAMLETT, B.S., M.S., PH.D.
Vice President for Extension & Public Service

H. HANLY FUNDERBURK, B.S., M.S., PH.D.
Vice President-Montgomery

H. FLOYD VALLERY, B.A., M.A., ED.D.
Assistant to the President

KATHARINE C. CATER, A.B., M.A., M.S., LITT.D.
Dean of Women

JAMES E. FOY, A.B., M.A., PH.D.
Dean of Student Affairs

L. E. FUNCHES, B.S., M.S.
Director of Buildings & Grounds

J. MICHAEL SPROTT, B.S., M.S., PH.D.
Director of Cooperative Extension Service

PAUL F. PARKS, B.S., M.S., PH.D.
Dean of Graduate School

RHETT E. RILEY, B.S.
Business Manager

JOSEPH B. SARVER, B.S.
Director of Development

R. D. ROUSE, B.S., M.S., PH.D.
Director of Agricultural Experiment Station System
Dean of School of Agriculture

WILBUR A. TINCHER, A.B., M.A., ED.D.
Director of Educational Services

J. HERBERT WHITE, B.S.
Director of University Relations

JULY

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1976—UNIVERSITY CALENDAR 1976-1977

1976—Summer Quarter (47 class days) and Eight-Week Term (37 class days)

- May 25, *Tues.*Last day for completing applications for admission
- June 14, *Mon.* ...Orientation for new students
- June 15, *Tues.*Registration and Schedule Adjustment (p.m.)
- June 16, *Wed.*Classes begin
- July 5, *Mon.*Independence Day Holiday
- July 19-23, *Mon.-Fri.*Registration for Fall Quarter*
- July 21, *Wed.*Mid-quarter
- Aug. 6, *Fri.*Classes end for term
- Aug. 9-10, *Mon.-Tues.* ...Final Exams for term
- Aug. 20, *Fri.*Classes end for quarter
- Aug. 21-25, *Sat., Mon., Tues., Wed.*Final Exams for quarter
- Aug. 26, *Thurs.*Graduation, 2:30 p.m.

1976—Fall Quarter (48½ class days)

- Sept. 2, *Thurs.*Last day for completing applications for admission
- Sept. 21, *Tues.*Final Registration
- Sept. 22, *Wed.*Schedule Adjustment
- Sept. 23, *Thurs.*Classes begin
- Oct. 26, *Tues.*General Faculty Meeting
- Oct. 25-Nov. 4, *Mon.-Thurs.*Registration for Winter Quarter*
- Oct. 27, *Wed.*Mid-quarter
- Nov. 24-28, *Wed. Noon-Sun.*Thanks-giving Holidays
- Nov. 29-Dec. 3, *Mon.-Fri.* ...Schedule Distribution and Fee Payment for Winter Quarter
- Dec. 2, *Thurs.*Classes end
- Dec. 3, *Fri.*Dead Day
- Dec. 4, 6, 7, 8, *Sat., Mon., Tues., Wed.* ...Final Exams
- Dec. 9, *Thurs.*Graduation, 2:30 p.m.

1977—Winter Quarter (47 class days)

- Dec. 13, *Mon.*Last day for completing applications for admission
- Jan. 3, *Mon.*Final Registration
- Jan. 4, *Tues.*Schedule Adjustment
- Jan. 5, *Wed.*Classes begin
- Jan. 31-Feb. 10, *Mon.-Thurs.*Registration for Spring Quarter*
- Feb. 8, *Tues.*Mid-quarter
- Mar. 7-10, *Mon.-Thurs.*Schedule Distribution and Fee Payment for Spring Quarter

UNIVERSITY CALENDAR—1977

Mar. 10, *Thurs.*Classes end
 Mar. 11, *Fri.*Dead Day
 Mar. 12, 14-16, *Sat., Mon., Tues., Wed.*Final Exams
 Mar. 17, *Thurs.*Graduation, 2:30 p.m.

1977—Spring Quarter (47 class days)

Mar. 3, *Thurs.*Last day for completing applications for admission
 Mar. 24, *Thurs.*Final Registration
 Mar. 25, *Fri.*Schedule Adjustment
 Mar. 28, *Mon.*Classes begin
 Apr. 25-May 4, *Mon.-Thurs.*Registration for Summer or Fall Quarter*
 Apr. 26, *Tues.*General Faculty Meeting
 Apr. 29, *Fri.*Mid-quarter
 May 25-27, *Wed.-Fri.*Schedule Distribution and Fee Payment for Summer Quarter
 May 31, *Tues.*Classes end
 June 1, *Wed.*Dead Day
 June 2, 3, 4, 6, *Thurs., Fri., Sat., Mon.*Final Exams
 June 7, *Tues.*Graduation, 2:30 p.m.

**1977—Summer Quarter (47 class days) and Eight-Week Term (37 class days)

May 24, *Tues.*Last day for completing applications for admission
 June 13, *Mon.*Orientation for new students
 June 14, *Tues.*Registration and Schedule Adjustment (p.m.)
 June 15, *Wed.*Classes begin
 July 4, *Mon.*Independence Day Holiday
 July 18-22, *Mon.-Fri.*Registration for Fall Quarter*
 July 20, *Wed.*Mid-quarter
 Aug. 5, *Fri.*Classes end for term
 Aug. 8-9, *Mon.-Tues.*Final Exams for term
 Aug. 19, *Fri.*Classes end for quarter
 Aug. 22-25, *Mon.-Thurs.*Final Exams for quarter
 Aug. 26, *Fri.*Graduation, 2:30 p.m.

NOTE: Schedule distribution and fee payment for Fall Quarter will be accomplished by mail prior to the opening of the quarter.

*The individual schools will publish the days of registration that will be utilized during the nine-day University registration period.

**All dates in the Summer Quarter are tentative and are subject to final approval prior to 1977-78 catalog printing.

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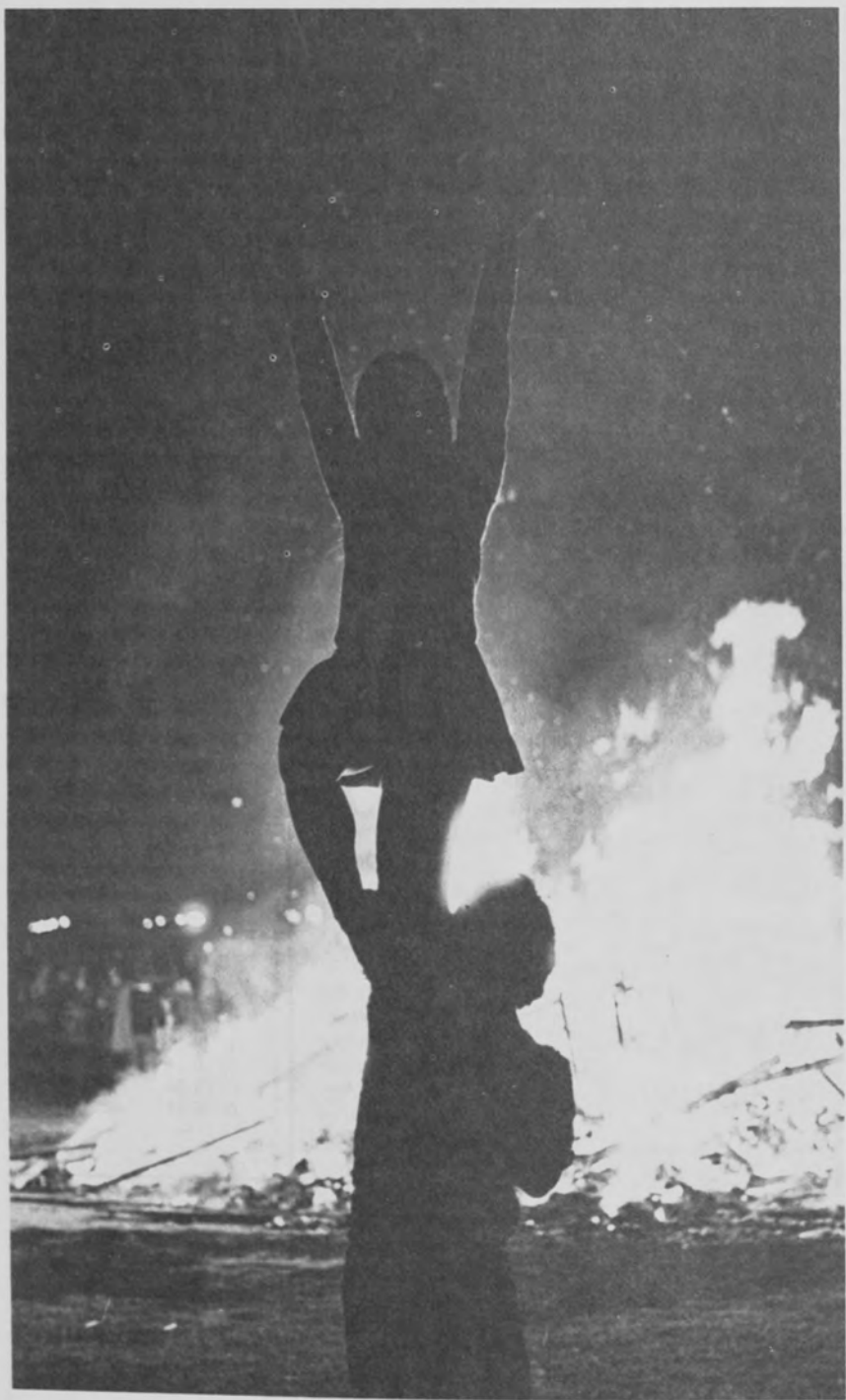
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The University

CHARTERED IN 1856, Auburn University is located in Auburn, Alabama, on Interstate 85 in the eastern section of the state. Here the University enjoys the advantages of the security, seclusion, and clear air afforded by this small residential city, surrounded by farms and woodlands. The 1,871-acre campus, with 60 major buildings, uncrowded and uncluttered, is distinguished by its buildings, lawns and flowers, trees and playing fields. During the University's long history nine Undergraduate Schools and a Graduate School have emerged to define and carry out the purposes of the institution. The academic program is fully accredited by the Southern Association of Colleges and Schools.

One of the nation's Land-Grant universities, Auburn is dedicated to the service of Alabama and the nation through its threefold mission of instruction, research, and extension. Research is carried on continually to increase knowledge. Extension programs reach throughout the state, providing educational services and special assistance.

The University is proud of its graduates, many of whom have distinguished themselves in the professions, business and industry, government and military service, politics, and athletics. There are 76,952 alumni living in the state, the nation, and abroad. Their loyalty, influence, and continuing support for Auburn are exceptional and of inestimable benefit to their alma mater.

Auburn traces its beginning to East Alabama Male College, a private liberal arts institution whose doors opened in 1859. The Civil War closed the school from 1861-1866. The college had begun an affiliation with the Methodist Church before the war, but this ended in 1872 when legal control of the school was transferred to the state. Auburn then became the Agricultural and Mechanical College of Alabama and enjoys the distinction of being the first land-grant college in the south to be established separate and apart from the state university. In 1892 women were admitted, and seven years later the name again was changed, to Alabama Polytechnic Institute. Following an interval of 50 years, the school acquired a title more appropriate to its location, size, and complexity: Auburn University. The institution has grown steadily throughout this century; however, it witnessed phenomenal growth, expansion, and change following World War II. Currently 17,000 students are enrolled, representing almost every state and 27 foreign countries. The majority are Alabama residents.

Recent expansion saw the establishment of a branch campus in 1967. Known as Auburn University at Montgomery, the institution has developed rapidly, especially since 1971.

Purpose of the University

Auburn's responsibility as a University is to maintain an environment of learning in which the individual and society are enriched by the preservation, transmission, and creation of knowledge. This obligation embraces Auburn's

continuing commitment to its land-grant traditions as well as its consciousness of involvement into a dynamic and complex institution whose programs of instruction, research and extension must be ever pertinent to the needs of a changing social order.

Auburn University, therefore, is dedicated to these purposes:

Providing for its students, within the resources of the institution, educational opportunities of a liberal character as well as those of a specialized nature;

Developing graduates whose knowledge, intellectual discipline, and awareness of the morality of individual action will be manifest in service to their fellow man and to the state and nation;

Conducting a broad program of faculty, undergraduate and graduate research, both basic and applied, to stimulate the faculty and students in their quest for knowledge, to promote their intellectual growth and development, to broaden the foundations of knowledge, to increase understanding of today's and tomorrow's world, and to aid society in resolving its scientific, technological and social problems;

Creating and implementing effective programs of education and service which will extend the scientific and cultural resources of the University to individuals, communities, institutions, and industries, thereby contributing to an improved technology, better environmental and health conditions, enhancement of the general level of living, and the development of more responsible citizenship;

Encouraging scholarly and creative effort in the arts, humanities, and sciences so that the University may serve its students and the community at large as a vital source of cultural enlightenment and as a stimulus toward their participation in the intellectual life; and

Reassessing continuously the value of particular objectives and programs of the University in order to make them accord with new knowledge and changing social conditions; and as a part of this reassessment to seek ever more efficient and imaginative means of fulfilling the University's purposes.

Research

Research is a major responsibility of Auburn University. In the early years investigation and discovery were largely confined to scientific areas. More recently research has embraced humanistic fields and creativity in the arts as well. The creation of knowledge by faculty and students is encouraged; steady growth in programs of basic and applied research find a direct parallel in the institution's increasing percentage of graduate enrollment.

The Agricultural Experiment Station was established in 1887 to conduct research, acquire information, and promote scientific investigation in agriculture. The Engineering Experiment Station was established in 1929 to assist industries in manufacturing processes and to develop natural resources. The Water Resources Research Institute began in 1963 to promote research and the training of scientists in water resources.

Auburn's fastest growing research area is sponsored research—an activity annually involving a multi-million dollar program of contracts and

grants, supported by federal, state, and private agencies; all of which bears witness to the University's research capability.

Extension

Extension, another of Auburn's principal responsibilities, involves developing and carrying educational services to the farms, homes, industries, communities, and municipalities of the state. The Cooperative Extension Service has provided such services to Alabama's 67 counties since 1914. Included are programs for agriculture, marketing, home economics, youth activities, community improvement, and resource development.

Through the Extension Division, educational programs and assistance are available through the Engineering Extension Service, the School of Architecture and Fine Arts, Business, Education, Pharmacy, and Veterinary Medicine. Also, Educational Television presents public service programs, and the University library cooperates with public libraries to make materials available throughout the state.

The Extension Division conducts the noncredit instructional program on the campus. Noncredit courses are offered at night to provide background for further study, cultural development, and renewal of professional skills.

Instruction

Instruction of students is the primary mission of the University. In the classroom, the laboratory, the library, Auburn University's goals are to quicken the student to reach his full potential, instilling respect for intellectual inquiry and understanding of cultural tradition; and to equip him with the knowledge and skills which he will need in a demanding and increasingly complex society.

The University faculty offers specialized instruction leading to the bachelor's degree in 137 fields in 56 departments, the master's degree in 52 fields, and the doctorate in 29 areas. The faculty and curricula are organized into ten schools: the *School of Agriculture*, the *School of Architecture and Fine Arts*, the *School of Arts and Sciences*, the *School of Business*, the *School of Education*, the *School of Engineering*, the *School of Home Economics*, the *School of Pharmacy*, the *School of Veterinary Medicine*, and the *Graduate School*.

Auburn University at Montgomery offers the baccalaureate and the master degrees.

On the Auburn campus, military instruction is available in Air, Military, and Naval Science basic and advanced programs.

Liberal Education Program

The University's instructional program for undergraduates specifies that each student complete a component of general studies in addition to the requirements of his School or departmental major: this general work covers a

foundation year of courses in English composition; world history, art history, or literature; natural science; mathematics or philosophy; and physical education; and is to be taken during the lower-division years, primarily at the freshman level. A certain number of hours must also be completed in elective courses lying outside the student's major area, these to be taken, in part at least, during the upper-division years.

The goals of this "experience in breadth" are to some extent intangible: the development in the student of the values of tolerance, intellectual honesty, and a capacity for reflective judgment. More specifically, it is hoped that the student will acquire also an ability to order his thoughts in a clearly expressed and reasoned manner; attain a grasp of the scientific method and discipline; develop some understanding of his culture and its backgrounds; and come to perceive the vital issues of our common life as citizens in a complex and changing world.

The minimal University requirements for all students are listed below; however the student should consult the appropriate curriculum model in his School for complete requirements.

		Requirement
English Composition EH 101-102-103 (3-3-3)	9	
History or Literature	9	World History 101-102-103 (3-3-3) or Technology & Civilization 204-205-206 (3-3-3) or World Literature (EH) 260-261-262 (3-3-3) or Art History 171-172-173 (3-3-3)
Natural Science	minimum of 10	Biology 101-102-103 (5-5-5) 101-104 (5-5) Chemistry 103-104 (5-5) 101-102-104 (2-3-5) Geology 101(5), 102 (5), 103 (5), 110 (5), Physics 205-206 (5-5) Physical Science 151-152 (5-5)
Mathematics or Philosophy	minimum of 5	Mathematics 100 (5), 140-161 (5-5), 180-181 (5-5) Philosophy 202 (5), 210 (3), 211-212 (3-3), 214 (3), 216 (3).
Physical Education	3	See page 240 for the various options for meeting this requirement offered by the Department of Health, Physical Education and Recreation.
Electives or Area Requirements	minimum of 20	Additional hours of liberal education studies will consist of coursework in two broad academic areas other than that in which the student's own major field lies (Humanities and Fine Arts, Social Sciences, Mathematics and Natural Science), with no less than one course in each area.

English Composition Requirements

No substitution for the freshman English requirement is permitted.

Credit in freshman English composition earned at another institution may be allowed on transfer as follows, except that no grade less than C will be accepted.

1. If the transfer student has fewer than three quarter hours of credit in freshman English composition, no credit is allowed. If he has three quarter hours credit in the first course of an English composition sequence, he must complete both EH 102 and 103.
2. If the transfer student has four quarter hours of credit in the first course of a three-course sequence, he must complete EH 102 and 103.

3. If the transfer student has either four or five quarter hours of credit in the first course of a two-course sequence, he must complete EH 103.
4. If the transfer student has three semester hours of credit in the first course of a two-course sequence, he must complete EH 103.
5. If the transfer student has earned eight or more quarter hours and has met the first year English composition requirement of the other institution, credit may be allowed for EH 101-102-103, provided the minimum of eight hours involves no duplication. A total of 12 hours may be accepted toward the graduation requirement when the 12 hours of work represents a continuous course sequence at one school. Students entering an undergraduate school at Auburn University after receiving a bachelor's degree from another accredited college or university are exempted from meeting these regulations.
6. No student failing a freshman English composition course at Auburn will be permitted to transfer credit from another school to offset that F, but must repeat the course in residence at Auburn.

All transfer students are directed to clear their freshman English composition credits with the Registrar as soon as possible after enrolling at Auburn University.

History—Literature Requirements

One of the purposes of the University's Liberal Education Program is to give the student an understanding of his culture and its backgrounds. Course sequences designed especially for this purpose are those in world history, world literature, technology and civilization, and art history. Students must earn nine hours of credit in one of these sequences.

Credit in history or literature earned at another institution may be allowed on transfer as shown below in meeting this particular requirement. The student's dean may require a C grade for a course to transfer.

1. If a transfer student has three or four quarter hours of credit in the first course of a three course sequence in history or literature, he must complete HY 102 and 103, HY 205 and 206, AT 172 and 173, or EH 261 and 262.
2. If a transfer student has four or five quarter hours of credit in the first course of a two course sequence, he must complete HY 103, HY 206, AT 173, or EH 262.
3. If a transfer student has earned eight or more quarter hours in a history or literature area and has completed the standard history or literature requirement of the other institution, he may be excused from this particular requirement in the Liberal Education Program.
4. If a student enters an undergraduate school at Auburn after receiving a bachelor's degree from an accredited university, he may be exempted from the history-literature requirement unless his curriculum major or minor specifies one of the four sequences described in this section.

Physical Education Requirements

Physical education is required for three consecutive quarters. Only one credit per quarter is permitted or transferable to meet the three quarter requirement.

Unless otherwise approved by his dean, each student who lacks physical education must register for an activity course in the first and succeeding quarters of residence until all requirements are met or until he becomes 26 years of age.

Students transferring from an institution not requiring physical education will have their physical education requirements reduced by the number of full-time quarters (15 hours credit per quarter passed) in residence at the former institution. Students who transfer from an institution requiring physical education will have their physical education requirements reduced by the number of quarters of physical education completed at the former institution.

Each student must file a medical record form with the Student Health Center and a physical education classification form with the Department of Health, Physical Education and Recreation before assignment of activities can be approved.

Libraries

The University maintains a general library known as the Ralph Brown Draughon Library and two specialized School libraries: one in Veterinary Medicine and the other in Architecture and Fine Arts. Draughon Library provides space for 2,000 readers and 1,000,000 volumes. Among its features are listening rooms and an extensive collection of recordings, a Browsing Room, and photocopiers conveniently located on each floor.

Current holdings include 783,515 bound volumes and 409,208 microforms. The library is a depository for government documents; it maintains the Alabama Room where special collections are housed. Among its serial subscriptions are more than 6,650 periodicals and 110 newspapers.

The plan of operation of the library is divisional. The collection is separated into social science, humanities, and science and technology sections. A convenient open shelf arrangement of the main collection makes material accessible. Comfortable, well lighted study areas are available, including carrels which graduate students and faculty may reserve.

Archives

The Auburn University Archives, located on the lower level of the library, was established in 1964 to house University records and to serve as a regional depository for manuscript collections. The Archives also holds photographic collections, historic architectural drawings, tapes of notable interviews and special lectures, and recordings of other historic events.

Computer Center

The Computer Center is located on the first floor of W. V. Parker Hall. Computer processing and associated services are provided for students, faculty, staff, and administration of the university.

The primary computer, in operation since September 1973, is an IBM System 370 model 155. There are four batch terminals at various locations on the Auburn campus, providing access to the 155. Also, a Hewlett-Packard computer, located in the "L" Building, with 25 typewriter terminals provides

additional support of classroom computer work. Terminals are located in various departments and dormitories on the Montgomery and Auburn campuses.

The Computer Center is a service department, and does not conduct an academic program in Computer Science, although some Computer Center staff members participate as faculty in Computer Science programs in the schools of Arts and Sciences, Business, and Engineering. Inquiries concerning these academic programs should be directed to the deans of these schools; some information is contained in the sections of this catalog pertaining to these schools.

All use of the 370/155 computer is coordinated through heads of academic and administrative departments. Request forms for computer services are available at 144 Parker Hall.

Several computer-oriented students find part-time employment at the Computer Center each quarter. Those interested should apply at the Student Employment Service in Mary Martin Hall.

Revenues

Auburn University receives financial support from student fees, state and federal appropriations, endowments, income from clinical services, sales, gifts, grants, contracts, and other sources. The largest single source of income is state appropriations.



Information for Prospective Students

Admissions

AUBURN UNIVERSITY is an equal opportunity educational institution and, as such, does not discriminate in its admissions policy on the basis of race, color, sex, creed, or national origin. Preference is given to the admission of Alabama residents; in considering applications to professional schools or programs with restrictive admissions policies, the length of residency in the state will be a factor.

Applications from out-of-state residents will be accepted for all curricula except Pre-Veterinary Medicine. However, the number of nonresidents who are admitted will be determined by the availability of facilities and faculty.

Application to any undergraduate school or curriculum of the University must be made to the Admissions Office, Auburn University, Auburn, Alabama 36830. Application forms and instructions can be obtained from the Admissions Office. Application to the Graduate School must be made to that School.

Individuals may apply for entrance to any quarter of a calendar year as early as October 1 of the preceding year.* Because of the large number of applications, credentials should be submitted at the earliest possible time. In all cases, complete credentials along with the physical examination report must be filed at least three weeks before the quarter's opening. The University reserves the right to establish earlier deadlines should circumstances warrant such action.

A \$10 processing fee must accompany all admission applications and is neither refundable nor applicable to other fees. Responses on the application forms and on related materials must be complete and accurate; entrance may be denied or registration cancelled as a result of false or misleading statements.

An applicant may receive provisional acceptance after he submits the application form (including a completed optical scanner sheet) and current academic documents. However, he must complete and return a medical examination report at least three weeks before the quarter opens. The University provides the medical report form; it also may require additional medical examinations if such appear advisable, and it may refuse admission to any individual whose health record indicates that his health or the University community might be adversely affected by his attendance.

Each applicant must furnish satisfactory evidence of good character. The University may deny admission to those whose presence is deemed detrimental to the institution or its students.

*Applicants to Veterinary Medicine will be admitted in the Fall Quarter only. See page 167.

Pre-College Counseling

In order to help entering freshmen and transfer students choose fields of study, and to adjust to their first quarter at the University, Auburn provides pre-college counseling.

Freshmen entering Fall Quarter attend counseling sessions on campus during the summer prior to entrance. In these sessions, students meet faculty members, administrators, and student leaders, and plan with their advisers a schedule of their first quarter of college work.

Freshmen entering the University any quarter other than Fall Quarter are usually required to report to campus one day early for counseling.

Transfer students may meet with advisers during the regular pre-registration period for the quarter in which they plan to enroll. Transfers will plan their schedules after their transcripts have been evaluated. A convocation for all transfer students is held on the first day of registration prior to the beginning of classes.

Admission of Freshmen

Enrollment limitations for freshmen have been established by curricula and schools, in proportion to available faculty and facilities. Favorable consideration for admission will be given to accredited secondary school graduates whose college ability test scores and high school grades give promise of success in college courses.

All secondary school students planning to apply for admission to Auburn should emphasize the following high school courses: English, mathematics, social studies, sciences, and foreign languages. A minimum of 16 high school units is required for admission. Four of these units may be vocational subjects.

Alabama residents are required to take the American College Test (ACT) on one of the announced national testing dates. Applicants from other states may present scores from either the ACT or the Scholastic Aptitude Test (SAT) of the College Entrance Examination Board. High school students may secure application forms from their principals or counselors. Scores on these tests are used as a partial basis for admission, for placement in English, chemistry, and mathematics, and for awarding University scholarships and loans.

At least one unit of college preparatory mathematics (algebra or geometry) is required for admission to any curriculum in the University. Curricula which list Mathematics 140 or 160 assume the student's competence in the mathematics taught in high school geometry and second year algebra. Curricula which list MH 161 as a first college course in mathematics presume, additionally, competence in high school "analysis" (the function concept, graphs of functions, the trigonometric functions).

A deficiency in the latter material can be remedied by taking MH 160. However, Auburn University offers no course comparable to high school geometry or to first and second year high school algebra. MH 140 can serve as a refresher course, but credit is not allowed for both 140 and MH 160. MH 100 is not a preparatory course for any of the above college-level courses.

Applicants of mature age who are not high school graduates may be considered for admission if their educational attainments—through testing—are shown to be equivalent to those of a high school graduate. The tests used include the USAFI General Educational Development Test, the American

College Test and/or other tests recommended by the Admissions Committee. Applicants from nonaccredited high schools will be considered on an individual basis by the Committee.

Early Admission—A student of high academic promise may be admitted directly from the eleventh grade without a diploma. Basic requirements for early admission include:

1. Proper personal qualifications.
2. Superior competence and preparation, evidenced by the high school record and college aptitude test scores (ACT, SAT or other tests prescribed by the University Admissions Committee).
3. A letter from the high school principal assessing the applicant's emotional and social maturity, and readiness for college work.

Additional information on procedure is available at the Admissions Office.

Advanced Standing—Students with superior preparation may be placed in advanced programs suited to their ability and academic background. Individuals with special competence may qualify for advanced placement or credit on the basis of high school grades, scores on college ability or achievement tests, the College Level Examination Program (CLEP) tests, proficiency tests, and military courses. See page 36.

Admission of Transfer Students

An applicant who was not eligible for admission to the University when he graduated from high school must present a minimum of 96 quarter hours or 64 semester hours of college credit to qualify for consideration as a transfer.

For residents of Alabama or other states who are party to the Southern Regional Education Board*, a satisfactory citizenship record, an overall C average or better on all courses attempted, and eligibility to re-enter the institution last attended are required for transfer admission. Residents of states not affiliated with the SREB must present at least a B average in addition to the other requirements. Entrance examinations may be required of applicants transferring from colleges with which the University has had little or no experience.

Transfer Credit—The amount of transfer credit and advanced standing allowed will be determined by the appropriate dean and the registrar. The dean will determine acceptance of D grades; credit in freshman English is allowed only on grades of C or better. See page 12. The maximum credit allowed for work completed in a junior college will not exceed the number of hours required in the first two years of the student's curriculum at Auburn.

Students transferring from unaccredited institutions or programs may be granted provisional credit. When such credit is allowed, the final amount of credit will be determined upon completion by the student of one year of course work at Auburn University. If a C average is not achieved, the amount of credit will be reduced in proportion to the number of hours in which the student fails to earn a C average or better.

*The fourteen states participating in the Southern Regional Educational Board's compact are Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

Transfer Within the System

Auburn University maintains a branch campus at Montgomery, Alabama. An undergraduate enrolled at either of Auburn's campuses who wishes to transfer to the other campus will be considered as a transfer student from any other accredited college. Because there is a slight difference between some curricula and courses at the two institutions, transfer credit and advanced standing will be determined by the academic unit and the registrar at the campus to which the student is moving.

Admission of Transient Students

A student in good standing in an accredited college may be admitted to the University as a transient student when faculty and facilities are available.

To be eligible for consideration, an applicant must submit an acceptable medical report and a completed Transient Student Form, bearing the signature of the dean or registrar of the college in which the applicant is currently enrolled.

Permission to enroll is granted for one quarter only; a transient student who wishes to re-enroll must submit a second Transient Student Form. Transient status does not constitute admission or matriculation as a degree candidate. The transient is, however, subject to the same fees and regulations as a regular student except for the physical education and continuation-in-residence requirements.

Admission of Unclassified Students

For residents of Alabama and other states affiliated with the Southern Regional Education Board, admission to undergraduate programs as an Unclassified Student may be granted on the basis of the bachelor's degree from an accredited college. For residents of states not affiliated with the SREB, Unclassified Student enrollment may be allowed on the basis of the bachelor's degree and an overall B average. Unclassified students must submit the same admissions credentials as transfer applicants.

Admission of Special Students

Persons who cannot meet freshman admission requirements but who are otherwise adequately prepared for University courses may be admitted as special students on approval of the Admissions Committee and the dean concerned. Course credits earned by special students generally cannot be used toward a degree at Auburn University.

Admission of International Students

The University welcomes admission inquiries from international students. Because of limited facilities, however, only those students who are academically strong will be given serious consideration for admission. Also, the international student should be proficient in English. In all cases, English proficiency is determined by satisfactory results on the Test of English as a Foreign Language (TOEFL), offered by the Educational Testing Service, Box 899, Princeton, N.J., 08540, U.S.A. The student must submit satisfactory results

on the Scholastic Aptitude Test of the College Entrance Examination Board, also offered by the Educational Testing Service.

An international student first should send all of his academic credentials to the Admissions Office for evaluation. If he appears to be qualified, and shows promise of success in his chosen field of study, he will then be asked to make formal application. The application must be accompanied by a recent photograph and an application fee of \$10 (not refundable). If the applicant presents satisfactory academic credentials, test results, and evidence that he has sufficient funds to meet his college expenses (there is no financial assistance for undergraduate international students), he will then be sent an acceptance and the form I-20, the authorization for a student visa. For further information, prospective students should write to the Admissions Office, Auburn University, Auburn, Alabama 36830, U.S.A.

Admission of Auditors

When faculty and facilities are available, an individual who does not seek admission for course credit may audit a lecture course or the lecture portion of a course upon approval by the Admissions Office, the dean, and the head of the department involved. A formal application must be filed, but the \$10 application fee and the physical examination report are not required. (See Auditing Privilege, page 31.)

Admission to Graduate Standing

Admission to graduate standing is granted only by the University Graduate School. A \$10 application fee is required. A bachelor's degree or equivalent from an accredited college or university and submission of satisfactory scores on the Aptitude Test of the Graduate Record Examination are required for Graduate School admission. Applicants for admission to doctoral programs must submit Advanced Test scores also. Certain departments require applicants to master's degree programs to take the Advanced Test.

The undergraduate preparation of each applicant must also satisfy the requirements of a screening committee of the school or department in which the student plans to major. A student in good standing in a recognized graduate school who wishes to enroll in summer session, off-campus workshop, or short session, and who plans to return to his former college, may be admitted as a graduate transient. For further information, see the section on the Graduate School and also the Graduate School Bulletin.

Readmission

Students who have previously attended Auburn and who wish to re-enter must secure a registration permit from the Registrar's Office. Former students who have attended another college for at least one quarter or semester must be eligible to re-enter that institution, if they desire to return to Auburn. Students who attended another institution for more than one quarter must have earned an overall C average or better to be eligible to re-enter Auburn. Two transcripts from the institution attended must be supplied to the Registrar.

Alabama and Non-Alabama Student Policy

For the purpose of assessing fees, applicants shall be classified as Alabama or non-Alabama students. Non-Alabama students except graduate students are required to pay a tuition fee.

An Alabama student is a person who shall be a citizen of the United States or a resident alien and who shall have resided and had his habitation, home, and permanent abode in the State of Alabama for at least 12 months immediately preceding his current registration. In applying this regulation, "applicant" shall mean a person applying for admission to the institution if he is married or 19 years of age, or, otherwise, it shall mean parents, parent or legal guardian of his or her person. If the parents are divorced residence will be determined by the residency of the parent to whom the court has granted custody. A student shall be classified as an Alabama student when his parent(s) or legal guardian establishes domicile within the state and is employed full-time in a permanent position in the state.

In the determining of an Alabama student for purposes of assessing fees, the burden of proof is on the applicant. An applicant can change his status from non-Alabama to Alabama student only by actually and physically coming into the state for the required period with the intention of residing within the state.

A non-Alabama student may apply in writing for reclassification prior to any subsequent registration. To qualify for reclassification as an Alabama student, the applicant (1) shall present evidence of having resided in Alabama for 12 consecutive months preceding his request for reclassification, (2) shall submit evidence that he has met the usual and expected obligations of an Alabama citizen, and (3) shall file a declaration of intent to reside in Alabama. An alien shall have resided in Alabama for 12 months and must present U.S. Immigration and Naturalization certification that he is a resident alien. If the application is supported by evidence satisfactory to the University that the student then qualifies as an Alabama student, his classification may be changed for future registrations.

A dependent of a member of the Armed Forces stationed in Alabama on active duty by official orders shall not be liable for payment of non-Alabama tuition during the period of military assignment in Alabama. Dependents of a member of the Armed Forces not stationed in Alabama must furnish proof of Alabama domicile. Verification of "Home of Record" must be attested to by military authority for a minimum period of one year before entry of the student.

The registrar shall have the responsibility for determining whether a student shall be classified as an Alabama or non-Alabama student. The decision of the registrar shall be subject to review by the President or his designated representative upon written request of the applicant.

Fees and Charges

Auburn University's fees have remained somewhat lower than those charged by similar institutions in the Southeast and in other sections of the country. As institutional costs have risen, small increases in fees have been authorized from time to time by the Board of Trustees. Every effort is made, however, to hold fees and charges at a minimum.

Payment of Fees and Charges—Students are expected to meet all financial obligations when they fall due. The University reserves the right to deny admission to or drop any student who fails to meet promptly his financial obligations to the University. It is each student's responsibility to be informed of all registration and fee payment dates, deadlines, and other requirements by referring to the official calendar of events in the catalog, announcements printed in the *Plainsman*, or disseminated by other means from time to time. Where necessary, students should inform their parents of the deadline dates, and the necessity for meeting them.

Checks—Checks given in payment of fees and charges are accepted subject to final payment. If the student's bank does not honor the demand for payment and returns the check unpaid, the student will pay the applicable late penalty fee of \$5 or \$10. If payment is not cleared promptly, the student's registration will be cancelled.

Veterans—Veterans enrolled under the federal GI Bills P.L. 358 and P.L. 634 receive their allowances directly from the Government and are responsible for paying their fees and charges on the same basis as other students. This does not apply to P.L. 894 or P.L. 815.

The following fees and charges are in effect at this time. However, since the catalog must be published well in advance of the next school year, it is not always possible to anticipate changes. **Thus the fee schedule may have to be revised. Every effort will be made to publicize changes as far in advance as possible.**

Basic Quarterly Charges

Students should be prepared to complete registration by payment of fees and charges, upon notice, two to three weeks before the beginning of the quarter. See fee payment dates in the Calendar, pages 6 to 7.

ENROLLMENT FOR TEN OR MORE CREDIT HOURS

University and Student Activities Fee (all curricula except Veterinary Medicine)	\$183.00
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University and Student Activities Fee for Veterinary Medicine	208.00
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The University Fee is used to meet part of the cost of instruction, physical training and development, laboratory materials and supplies for student's use, maintenance, operation, and expansion of the physical plant, Library, Student Health Services and Student Activities.

The Student Activities portion of the fee supports such activities on campus as intercollegiate athletics, exhibits, *Glomerata*, intramural sports, *Plainsman*, religious life, social affairs, student government, student union activities and operations, and *Tiger Cub*. This fee includes 25¢ held in reserve to cover unnecessary damage to University property by students.

Non-Alabama Fee	\$175.00
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Additional fee charged all non-Alabama undergraduate, special, and unclassified students taking 10 or more hours. This fee is not charged to graduate students.

ENROLLMENT FOR FEWER THAN TEN CREDIT HOURS

Registration Fee	33.00
Additional fee per credit hour	15.00

No additional charge is made beyond 10 hours. Students who register for 10 or more hours will pay a maximum of \$183.00 as Alabama students or \$358.00 as non-Alabama students. The \$33.00 registration fee is remitted to full-time faculty and staff taking no more than five credit hours. All students except faculty and staff are eligible to participate in Student Health Services and Student Activities.

Clearing for Graduation Fee	33.00
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A student who is a candidate for a degree in a quarter in which no credit work is taken is required to register in such quarter as a prerequisite to graduation. (For members of the faculty and staff the charge shall be reduced to \$5.) Graduation fee is to be paid in addition to this charge.

Other Fees & Charges

Fee for Late Registration or Late Payment	\$5.00-10.00
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All students, regardless of classification, must clear fees and tuition by the deadline set by the University, or pay the following additional charges:

Through official schedule adjustment period.	5.00
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Effective with beginning of classes	10.00
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Achievement Certificate Fee	5.00
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Application Fee	10.00
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The application fee must accompany all application for admission. Not refundable nor applicable to registration fees. (See section on Admissions.)

Auditing Fee (per course)	15.00
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Any student who pays less than full fees must pay this fee for auditing a course. (Not charged to faculty and staff.)

Change in Course fee	\$ 5.00
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Charge is made in cases where student is not required or advised by the University to change, but has the Dean's permission to do so after Schedule Adjustment period.

Change in Curriculum Fee (if change made after classes begin)	5.00
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Correspondence Study Course Fees

Registration Fee	5.00
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Additional fee per credit hour	15.00
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Duplicate Diploma Fee	10.00
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Doctoral Dissertation Microfilming Fee	30.00
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Equivalency Examination Fee (GED) (each)	10.00
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Field Laboratory Program—Off Campus Courses

Registration Fee	15.00
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Additional fee per credit hour	15.00
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Graduate Thesis and Dissertation Binding Fee (per copy)	4.50
Three to five copies usually required.	
Graduation Fee	10.00
Payable at beginning of the quarter in which the student expects to receive a degree. Deadline— two weeks before Graduation (transferable to next quarter or refundable if student fails to qualify).	
Cap and Gown Rental Fees (for Graduation Exercises)	
(includes retaining of tassel)	
Bachelors—cap and gown	3.50
Masters—cap, gown, and hood	6.75
Doctorate—cap, gown, and hood	7.40
Journalism Internship JM 425	
Law Enforcement Internship LE 464	
Political Science Internship PO 450	
Retail Training HE 335	
Fees will be one-half the full University Fee and one-half the non-Alabama student fee if applicable.	
Music Fees	35.00
This additional fee to be paid at the time of registering for each applied Music Course of individual instruction. Instruction is available in one hour or two half-hour lessons per week.	
Rent for Dormitory Room , per quarter	95.00 to 210.00
Rent for Married Students Apartments , per month	93.00 to 108.00
Meal Plans (See section on Food Services under Student Services and Programs.)	
Quarterly meal plans range up to (plus tax)	245.00
ROTC Uniform and Equipment Deposit	30.00
All students, both Basic and Advanced, are required to deposit the sum of \$30 with the University Bursar, prior to enrollment in ROTC, except for Naval ROTC. The deposit, less \$1.50 per quarter for ROTC activities and uniform repairs, is refunded to the student on completion of the program or withdrawal therefrom and the return of the uniform and other supplies.	
Service and Penalty Charges	
Registration fees billed home,	
To parents, to Trust Funds, to companies, or other sponsors	2.00
Charge for each returned check	2.00
Failure to pay fees due or to make returned check good on notice where two or more notices are required	5.00 or 10.00
Notice: CHECKS ARE ACCEPTED SUBJECT TO COLLECTION	
Special Services Fees	
Cooperative Education Program	15.00
Internship Fee-Veterinary Medicine	15.00
Postdoctoral Fellow: One-time Enrollment	15.00

Transcript Fee**Registration Fee Cancellations or Refunds**

If the student who has paid fees before the opening of the quarter officially resigns *prior* to the beginning of the quarter, all fees except late fees will be refunded. If the student resigns within the first two weeks of classes, all fees less charges will be refunded except the sum of \$33 for handling. Also if the student has used the University Health Service during that quarter, the \$15 Health Services Fee will be retained. No refunds will be made in case of withdrawals after two weeks of classes except in cases of resignation caused by personal illness (physician's statement required) or call into military service (copy of activation orders required). Students suspended for disciplinary reasons are not eligible for refund or cancellation of accounts due.

Financial Aid

The Office of Student Financial Aid at Auburn University provides financial assistance to worthy students, to help them meet expenses incurred while in school. The University believes that the amount of aid granted should be based on financial need. To determine need, Auburn uses the ACT Need Analysis System of the American College Testing Program. Entering students seeking aid are required to submit annually the Family Financial Statement to the ACT Program. Applications for aid should be completed in January or February of the year prior to the academic year in which the student will need assistance.

A brochure describing financial aid and procedures may be obtained by writing to the Office of Student Financial Aid.

The financial aid for which students may apply includes grants, loans, and employment.

Scholarships may be awarded to undergraduates with financial need who have shown high academic attainment and promise. Basic Educational Opportunity Grants are provided to entering students who can demonstrate need. Supplemental Educational Opportunity Grants are available, in limited number, to students with exceptional financial need.

National Direct Student Loans and Institutional Loans provide long-term loans to students who can demonstrate need. Federal-State Student Guaranteed Loans may be obtained, on a long-term basis, from banks, credit unions, etc.

College Work-Study Program provides employment for students from low income families, who need work to stay in school. Health Professions Assistance makes available long-term loans and scholarships for students in Pharmacy and Veterinary Medicine. The Law Enforcement Education Program provides loans or grants to full-time law enforcement officers.

Graduate students may be eligible for teaching and research assistantships and traineeships. Information is available from the head of the department of the student's major field.

Employment

Students seeking part-time employment while attending the University should contact the Student Employment Service. As a referral agency, the service assists students in finding employment on campus as well as with businesses and industry in the local area. Applicants for employment are referred to prospective employers on the basis of the date of application and the skills of the applicant.

Auburn University employs in excess of 1,000 students on an hourly basis. Students may work a maximum of 20 hours per week while enrolled for six or more quarter hours of academic work, or 40 hours per week if enrolled for five or fewer hours per week. The number of hours set by off-campus employers may vary but are usually from 10 to 30 hours per week.

The Student Employment Service is located in the Office of Student Financial Aid, 312 Martin Hall. Students may obtain applications in person or by mail.

Cooperative Education Program

The Cooperative Education program provides opportunities for students to alternate quarters of academic study with quarters of experience in industry, education, business, and government agencies.

Coordination of study and work combines theory and practice. As a consequence students find increased meaning in and motivation for their studies. This experience helps to develop a sense of responsibility, judgment, and maturity. Students also benefit financially, since they are paid for their work.

In all four-year curricula, the Cooperative Education Program is a five-year plan. A student must complete at least two quarters of the freshman year with an above average scholastic record before he is placed with an employer. It is offered in all curricula of the Schools of Agriculture (except Forestry), Architecture and Fine Arts, Arts and Sciences, Business, Education, Engineering, and Home Economics.

Additional information may be secured from the Director, Cooperative Education, Auburn University.

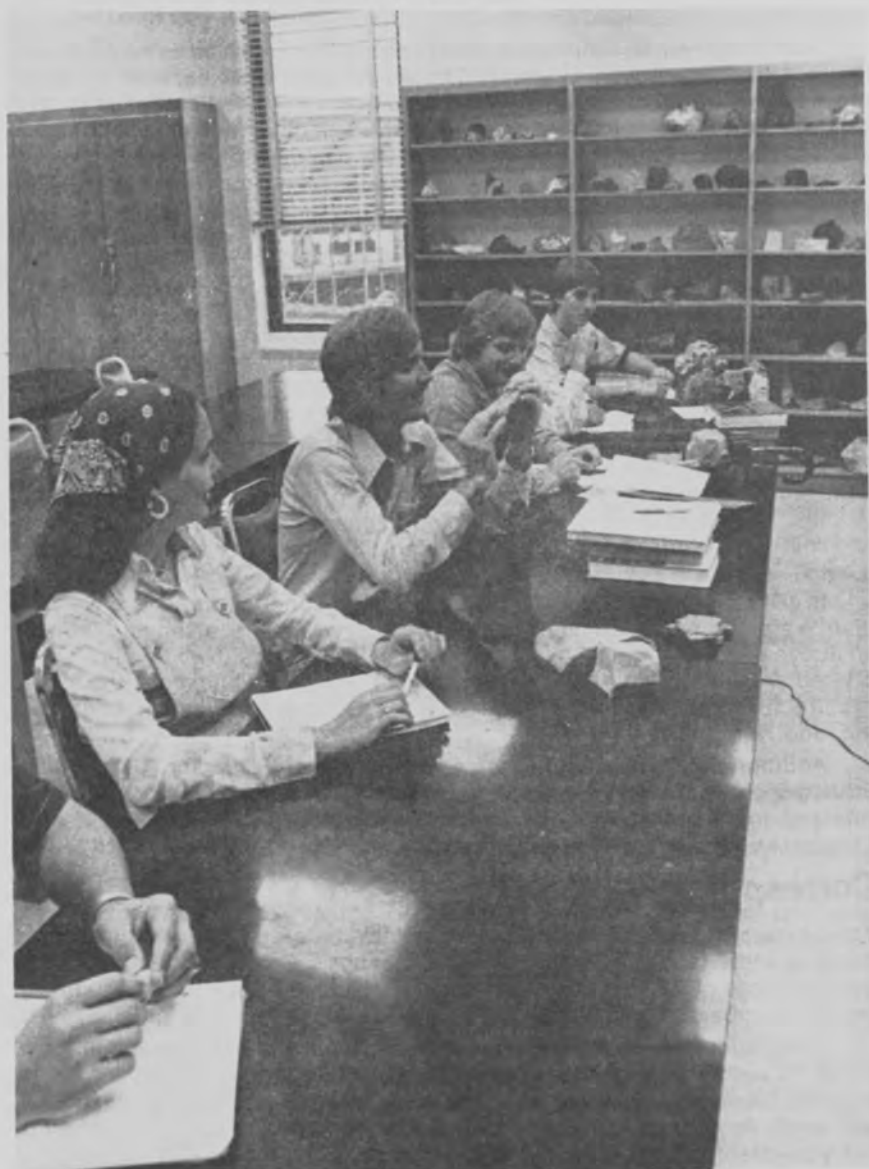
Correspondence Study

The Correspondence Study program provides undergraduate instruction for persons unable to attend college on a regular basis. Correspondence courses parallel those given in the University, carry college credit, and are taught by faculty members.

The student, upon registration, will receive a course outline and instructions. He will be expected to do textbook readings, written preparations, and possible supplemental work. A final examination is given upon completion of unit work. Any person is eligible for enrollment, although such enrollment is not equivalent to admission to the University.

Although graduate credit cannot be earned by correspondence, certain undergraduate deficiencies may be cleared.

Fees for correspondence courses are listed under Fees and Charges. See also Off-Campus Credit in the section on Academic Regulations. Application forms and additional information are available from the Director, Auburn University Correspondence Study Program.



Academic Regulations

Registration and Scheduling

Every student who makes use of the instructional staff and facilities of the University must register and pay fees. This rule also applies to students who are clearing incomplete grades, clearing for graduation, or working on graduate theses. The University Calendar on pages 6 and 7 lists the dates for registration, schedule adjustment and distribution, fee payment, and final registration. The student's dean authorizes and approves the subjects for which the student registers, as well as any changes or adjustments in his schedule. Courses should be scheduled in sequence as they appear in the curriculum model.

The student is urged to register during the computer-assisted registration held in the quarter preceding the term for which he is registering. A currently enrolled undergraduate who fails to do so is charged a late fee. Fall Quarter schedule distribution and fee payment are accomplished by mail in September. A final registration is held one to two days before the first day of classes.

When registering, the student is responsible for observing the prerequisites or corequisites of courses. Any waiver of these requirements must be approved by the instructor and/or his department head. Also, waiver of the junior standing prerequisite for courses that may be taken for graduate credit must have the Graduate School dean's approval.

Late registration must be authorized by the student's dean, and a late fee will be charged. A student's class load may be reduced by his dean. No student will be registered after the tenth day of classes without the approval of the Vice President for Academic Affairs.

Course credit completed at another college or university while the student is concurrently enrolled at Auburn University will not be counted toward his degree without prior permission from his dean.

Registration and Readmission Permits

Entering freshmen and first-quarter transfer students obtain permits to register from the Admissions Office. Previously enrolled undergraduates secure their permits from the Office of the Registrar; graduate students receive theirs from the Graduate School.

A student seeking readmission who has attended another college since he was enrolled at Auburn University must (1) be eligible to re-enter the last institution attended and (2) have a C average overall on course work attempted at other colleges attended two or more terms. Two official transcripts from each institution attended must be furnished to the Registrar's Office.

Change of Major or Curriculum

A student must have his dean's approval to change to another major within the same School. To change Schools within the University, a permit from the Registrar's Office is required.

Course Load

The maximum load for students in undergraduate curricula is 19 quarter hours. A normal load is 15-19 hours per quarter. With his dean's approval, a student may schedule less than a normal load.

The maximum load may be exceeded under the following circumstances.

1. The academic dean may approve up to 20 hours as a convenient load.
2. On approval of his dean, a student may schedule an overload not to exceed 23 hours if, during his last residence quarter at Auburn University in which he carried 15 or more hours, he passed all work attempted and earned a grade point average of 1.5 or higher. A student who has scheduled fewer than 15 hours during an intervening quarter (or quarters) will retain the overload privilege if all work carried was passed with a minimum grade-point average of 1.5 in each intervening quarter. In special cases the dean may make exceptions to the 1.5 requirement, by written notice to the Registrar.
3. On approval of his dean, a graduating senior who is ineligible to carry an overload may schedule a maximum of 23 hours if the overload will allow him to graduate in that quarter.

A student who registers for work in excess of his approved load may be required by his dean to drop the overload during the Schedule Adjustment period.

Curriculum Model Change

When the University changes a curriculum model, a student in the altered curriculum may be required to complete the subjects and hours placed above the level to which he has progressed. He will not, however, be required to complete additional subjects placed in the curriculum below the level he has achieved. Courses shifted from one class level to another are exempt from this latter provision. The student's dean will determine the revised subject requirements, and the Registrar will determine the revised total hour and grade-point requirements. In no case, however, will the changed curriculum compel a student to accumulate additional hours and grade points in order to graduate.

Classification

The undergraduate's classification will be determined by the number of credit hours he has earned at Auburn and elsewhere.

<i>Freshman</i>	47 or fewer quarter hours
<i>Sophomore</i>	48-95 quarter hours
<i>Junior</i>	96-143 quarter hours
<i>Senior</i>	144 or more quarter hours

The numbering sequence for identifying the classification of students is as follows: 1, Freshman; 2, Sophomore; 3, Junior; 4, Senior; 5, fifth year for Pharmacy, Architecture, and Veterinary Medicine; 10, Unclassified (non-degree students); 12, Special and Transient students and auditors only; 6, 7, 8, 9, 11, and 13 are Graduate student classifications.

A student with a baccalaureate degree who undertakes a program for a second bachelor's degree will be classified as an undergraduate.

Auditing

Auditing of courses is restricted, and rarely permitted in laboratory courses. A student's audit privilege is granted only on the approval of the dean and the head of the department of the course involved.

Auditors not previously admitted to the University must be approved for registration by the Admissions Office. They must register and pay appropriate fees. Although listed on class rolls, auditors are not required to take part in classroom discussion, tests, examinations, or reports. They will receive no grade or credit.

A student may not change from audit to credit after classes begin, but he may change from credit to audit within the first three weeks of classes. No refund of fees will be made except for changes made during the first two weeks of classes in accordance with University policy.

Class Attendance

The University regards the final grade for a course as a measurement of the student's performance in achieving the objectives of the course. Absence from class sessions, in and of itself, should not influence the final grade.

The student shall be expected to carry out all assigned work, including laboratories, and to take all examinations at the class period designated by the instructor. Normally it is difficult to make up laboratories; therefore, the student must attend laboratory sessions during the times for which he is registered. Failure to carry out these assignments or to take examinations at the designated times will result in an appropriate reduction in grade, except as provided in the following paragraphs:

Each instructor shall determine the policy regarding assigned work which he feels is best for his course. In developing this policy the instructor shall consider carefully the nature of the course, the maturity level of the students enrolled in the course, and the consequent level of flexibility which his policy will include. The policy, along with the instructor's requirements for announced and unannounced examination attendance, shall be presented to the class, preferably in writing, at the beginning of the quarter and will govern the actions of the instructor in the course.

Instructors will be expected to recognize and honor official University excuses which may be issued to groups or individuals for absences due to participation in authorized University activities (athletic teams; events of a traditional nature such as the Hutsell Freshman Cake Race; or for absences directly related to the academic program such as authorized field trips*), and to make allowances for student absences caused by illness or personal emergencies. Arrangements to make up missed work shall be initiated by the student. Such arrangements could result in delayed due dates for assignments, or in IN or other deferred grades.

*Field trips will be authorized by the department and dean of the School in which the course is taught. The instructor will issue an official excuse to each student participating in the field trip. Any student may decline participation in a given field trip and receive an appropriate compensating assignment if, following consultation with his instructor, it appears that the field trip would adversely affect his other academic work.

Excuses for student absences of a nonacademic, extracurricular nature will not be issued by the University but will be granted at the discretion of the individual instructor. Any evidence or request for consideration that the student may feel justifies his absence may be presented to the instructor for review.

Excuses for the purpose of attending reserve military training are normally denied.

The regularly accepted time for class procedure to begin shall be 10 minutes after the hour. If the instructor does not appear within 20 minutes after the hour, it may be assumed that the class is cancelled. All classes shall be dismissed promptly on the hour.

In order that the University may have effective class days, it is University policy that all classes will meet as scheduled the last day before holidays and the first day after holidays as designated by the University.

Unresolved problems may be referred to the office of the Vice President for Academic Affairs for resolution.

Examinations

Examinations are classified as (1) final examinations at the end of each quarter; (2) special examinations; and (3) other course examinations as determined by the instructor. The final examination policy is stated below.

Announced tests in undergraduate courses will be administered at a regularly scheduled meeting of the course. Exceptions to this regulation may arise in specialized courses requiring performance or oral tests, and in multiple-sectioned laboratory classes requiring practical laboratory tests. Faculty having sound reasons for scheduling tests at times other than regularly scheduled meeting times are to obtain approval from the department head prior to the beginning of the quarter, and are to present a written schedule of these changes to the class during the first few days of the quarter. Rescheduled tests are not to interfere with other scheduled academic endeavors of the students involved, and an appropriate reduction in regularly scheduled class time is to be given to compensate for the rescheduled test period.

FINAL EXAMINATIONS. A final examination is a desirable means of evaluation in most undergraduate courses. In unusual circumstances, performance tests, term papers, research projects or other forms of evaluation appropriate to the objectives of the course may be substituted for a final examination with the approval of the department head, who will report his action to the dean and Vice President for Academic Affairs. Faculty not giving a final examination are to present to the class at the beginning of the quarter a written description of how final grades will be determined.

Final examinations should be administered during the hours specified in the quarterly examination schedule. Due to the specialized nature of many small upper-level undergraduate courses and graduate courses, deviations from this requirement are sometimes warranted. Such deviations are to be approved by the Vice President for Academic Affairs, and rescheduled examinations must not interfere with scheduled academic activities of the students involved. The professor teaching a 600-level course shall determine whether a formal final examination is appropriate.

Grades

Final passing grades are A, superior; B, good; C, acceptable; D, passing; and S, satisfactory. Final failing grades are F, failure; XF, absent from final examination and failing at the time; U, unsatisfactory; and WF, officially dropped with permission of the student's dean but failing at time of withdrawal.

An X is assigned if the student is passing but missed the final examination, or if he has incomplete work and is absent from the final examination. An IN is assigned if the student has cleared the final examination but has not completed other required work. Grades of X and IN must be cleared during the student's next residence quarter or they will be recorded as permanent failing grades.

The first four days of each quarter are designated as the Special Examination period to remove X grades. The student will get a permit from his dean in order to make up a missed examination. A grade of IN will be changed by the Registrar upon written notice from the instructor. A final grade may be changed only by the written request of the instructor, with the approval of his department head and dean which must be submitted to the Registrar.

GRADE ASSIGNMENT FOR CLASS WITHDRAWALS. No penalty shall be assigned for dropping a course on or before the fifteenth day of the quarter. (For courses with fewer than five meetings per week, 15 class days should not be confused with 15 class meetings.)

If a course is dropped after the first 15 days, but by the date of mid-quarter, the instructor shall assign a grade of W (passing) or WF (failing) as the case may be. A course can be dropped with a W after mid-quarter only under unusual conditions. When approval for dropping the course under such circumstances is granted by the student's dean, a W may be assigned only when the instructor indicates that the student is clearly passing the course. Otherwise, a grade of WF is assigned.

GRADE AVERAGE AND QUALITY POINTS. A 3.00 grade scale is used. An A equals 3.00; B, 2.00; C, 1.00; and D or F equals 0.00. Only course work attempted at Auburn University is used in determining the grade report average and continuation-in-residence requirements. S and U grades do not enter into grade-point computations.

S-U GRADING. Grades of S (Satisfactory) and U (Unsatisfactory) may be assigned only to 699 and 799 courses, AED 798, courses approved to be graded S-U, and courses elected under the S-U option.

A junior or senior with a minimum overall grade average of 1.5 on at least 30 hours of credit earned at Auburn may elect any course to be graded on the S-U option, except for courses required in the freshman and sophomore years or for courses constituting the major as defined by the student's curriculum. A total of 20 credits may be earned at the rate of one course per quarter. The student will receive credit toward his degree for these courses, provided credit is normally accepted in his curriculum for this course work.

An unclassified student may schedule one or more courses on the S-U option with the approval of his dean. Course work completed on the S-U choice by unclassified students may not be applied later to degree requirements should the student become a degree candidate.

A graduate student may enroll in undergraduate courses, except for 400-level courses taken for graduate credit, under the S-U option on his major professor's recommendation.

Students are not permitted to change from S-U grading to conventional grading or vice versa after the schedule adjustment period.

GRADE REPORTS. In compliance with the Family Rights & Privacy Act (Buckley Amendment) of PL 93-380 (Educational Amendments of 1974) one copy of each student's grade report is mailed at the end of each quarter to the student at the address furnished by the student.

Dean's List

The name of every eligible student who meets certain scholastic requirements for a given quarter is placed on a list prepared for the dean of his School. This honor is also noted in the student's permanent record.

To meet Auburn University's requirements for inclusion on the dean's list, the student must be enrolled for 15 or more credit hours exclusive of any S-U option courses, pass all courses attempted for the quarter, and earn a grade-point average of at least 2.40 (on the 3.00 system). Furthermore, the dean of each School has established specific criteria governing inclusion on the list. The special requirements, applied in addition by the University regulations, are listed as follows:

School of Agriculture: 2.65 average.

School of Architecture and Fine Arts: a grade-point average within the upper 10 per cent of the full-time students enrolled in a given department.

School of Arts and Sciences: 2.75 average.

School of Business: 2.80 average.

School of Education: 2.80 average.

School of Engineering: 2.40 average; only if an S-U graded course is required in the student's curriculum may it be included in the 15-hour minimum total.

School of Home Economics: 2.80 average; only if an S-U graded course is required in the student's curriculum may it be included in the 15-hour minimum total.

School of Pharmacy: 2.50; only if an S-U graded course is required in the student's curriculum may it be included in the 15-hour minimum total.

School of Veterinary Medicine: grades in the upper five per cent of the enrollment of each class.

Resignation

A student who wishes to resign from all course work for a quarter should contact his dean. He withdraws without penalty of failure if he resigns no later than mid-quarter, a date specified in the University calendar.

After this date, the dean will obtain from the student's instructors his scholastic standing at the time of resignation, and report it to the Registrar. If the student is failing in over half his work, the number of hours reported as

failing will be counted as credit hours attempted and will be included in academic eligibility calculations. Those hours reported as passing will be dropped and will not be counted in the grade-point computation. Furthermore, when a student's total hours attempted exceed grade points earned by more than 21 at the end of his last quarter in residence prior to resignation, his grades will be reviewed by his dean to determine whether he has a C average for the quarter in which he is withdrawing. If the student does not have a C average, he will be placed on academic suspension.

When a student through illness or physical disability is forced to resign after mid-quarter, and when this condition has been the main factor in causing scholastic deficiencies, discretionary power in waiving the scholastic penalty will rest with the student's dean. A student who is resigned for disciplinary reasons will retain the academic status he achieved immediately prior to the disciplinary action.

Academic Probation and Suspension of Undergraduates

Auburn University may place an undergraduate student on probation or suspension at any time if he flagrantly neglects his academic work or makes unsatisfactory progress toward graduation.

Academic eligibility requirements for continuation in residence are calculated on Auburn University course work. Academic probation is a scholastic warning, indicating that the student is in danger of being suspended. A student on probation can continue his enrollment without interruption. Academic suspension is a status that bars a student from continued enrollment at the University for a period of time.

A student will be placed on academic probation whenever his total number of hours attempted at Auburn exceed grade points earned by more than 12, except that no entering freshman will be placed on probation on the basis of his first quarter's work at the University.

A student may remove his probation status by reducing his grade point deficiency to 12 or fewer grade points.

An individual on academic probation will be placed on suspension when the number of hours he has attempted at the University exceed grade points earned by more than 21. However a student will not be suspended at the end of a quarter in which he earns a 1.0 (C) average, but will be continued on probation.

A student's first academic suspension will be for a period of two quarters, summer quarter being counted as any other quarter. He will be readmitted on academic probation following the expiration of his first suspension. A student who incurs a second academic suspension is placed on indefinite suspension of at least four quarters before his application for readmission will be considered.

An academically suspended student who has incomplete or other deferred grades which could, when cleared, remove his suspension will be permitted to register conditionally for the next quarter. The suspension must be removed within two weeks of the beginning of the quarter; otherwise he will be resigned by the Registrar's Office.

No credit earned at another institution by a student on academic suspension from Auburn will be used in clearing a suspension or in meeting requirements for an Auburn University degree.

Suspensions incurred prior to implementation of the above regulations shall not be considered when determining a student's academic status.

A student who resigns after mid-quarter may be subject to academic suspension. (See Resignation on page 34 for further information.)

SCHOOL OF PHARMACY. A student enrolled in the School of Pharmacy who is placed on academic suspension and who wishes to re-enter the School must, in addition to complying with other University readmission requirements, be approved for readmission by the Pharmacy Admissions Committee and, when applicable, by the University Admissions Committee.

SCHOOL OF VETERINARY MEDICINE. Students enrolled in the School of Veterinary Medicine who fail to make a grade-point average of 1.25 in any quarter will be placed on academic probation. Those on probation who fail to make a 1.25 average in the following quarter may be dropped from the School. Students who make a grade of F on any course may be required to withdraw from the school. If readmitted, such students may be required to repeat certain other courses in the curriculum for that quarter.

Students who are dropped under the above provisions are eligible for admission to other curricula provided they meet the general scholastic requirements for continuance in the University. Scholastic penalties incurred during enrollment in the School of Veterinary Medicine will become part of the student's record.

Advanced Standing and Credit

Entering freshmen with superior preparation may qualify for advanced placement and/or credit not to exceed a total of 45 quarter hours in the following areas: biology, botany, chemistry, English, foreign language, history, mathematics, physics, and zoology.

Advanced placement or credit may be granted to entering freshmen who during their senior year in high school have made satisfactory scores on the College Board Advanced Placement Examinations. A student with special competence in a specific area, as evidenced by secondary school records and scores on college ability or achievement tests, may qualify for advanced placement or credit by scoring well on a departmental proficiency examination.

The amount of credit allowable through advanced placement is determined by the dean and the department head concerned.

Students transferring to Auburn University who have received advanced standing credits from another institution may be awarded advanced standing credit for examinations, advanced placement and CLEP tests, military service courses or experiences, and proficiency tests insofar as the University's requirements for awarding such credits are met and the credits are applicable to the student's curriculum.

The prospective student is advised to write to the Registrar's Office at Auburn University requesting a brochure on the Advanced Standing Program. This brochure details the advanced placement and credit programs, the College Level Examination Program (CLEP), the General and Subject examinations of the CLEP, and the minimum scores required on the tests.

DEPARTMENTAL PROFICIENCY EXAMINATIONS may be given by a department upon application of the student. He may apply for such a test if he has taken college-level work in secondary school, in class or on a tutorial basis, or through private study. If he earns a satisfactory grade on the subject examination he will be eligible for placement in an advanced course and for credit in the subject.

MILITARY SERVICE CREDIT. Students who have served in the Armed Forces may receive credit for military courses completed at the college level, General Educational Development tests (except English), and correspondence courses completed through the Armed Forces Institute.

Those who have had military service and who do not meet the University's physical education requirement may receive credit as follows: for less than six months service, no credit; for six months to a year, one hour for Physical Education 101; for one year in service, two hours credit plus one hour's credit for swimming if the student passes the departmental swimming test.

Application for credit should be submitted to the Registrar. The student's dean must approve credits into the student's curriculum.

Correspondence and Extension Credit

A student may earn a maximum of 10 per cent of the total credits required for his baccalaureate degree by correspondence or extension; however only 18 hours of the final year's work may be earned thus. An individual having less than three quarters in residence prior to his last academic year may earn only 10 hours by correspondence or extension.

A student in residence may not enroll in a correspondence course if the course or a suitable substitute can be scheduled. The resident student may not exceed the maximum class hour load by adding a correspondence course.

The grade earned for correspondence credit will be entered on the student's record, but the grade points will not be included in the University grade average or continuation-in-residence requirements, nor will they exceed the credit hours earned.

Information on available courses may be obtained from the Correspondence Study Office, School of Education, Auburn University.

Degree Requirements

To earn the bachelor's degree a student must complete the subjects in his curriculum and must earn at least a C average on credits accepted for his degree program. An individual with credit from another institution must also have on his Auburn course work grade points equal to the credits used in his curriculum. Credits required for graduation range from 196 to 260 hours.

The student's dean clears subject requirements in the curriculum; the Registrar clears total hour, grade point, freshman English, and physical education requirements.

Forty-five hours must be earned in residence in order to receive a bachelor's degree. As a general rule the 45 hours must be taken in the final year

and in the school or curriculum of graduation. The student's dean may waive the final year's residence, and may also allow course credit to be earned at another institution during the final year. However the 45 hours in residence at Auburn is a firm requirement.

To complete a second baccalaureate degree, an Auburn graduate must complete an additional 45 hours, at least 45 grade points, 36 weeks in residence, and satisfy course requirements in the curriculum. A graduate of another four-year institution who seeks a bachelor's degree at Auburn must complete the hours required in the final year of his curriculum and satisfy the requirements listed immediately above.

Seniors must clear deferred grades by the tenth day of the graduation quarter for courses to be used toward degree requirements. Correspondence courses must be completed by mid-quarter prior to graduation.

A graduation fee is payable to the Cashier's Office, at the beginning of the quarter of graduation. If a student is in default on any payment due the University, his diploma and academic record will not be issued until the matter is cleared.

Degrees are conferred at Commencement exercises each quarter. If a student does not plan to attend the exercises, he should make arrangements with his dean or the Registrar to receive his degree *in absentia*.

Graduation Honors

Students with a minimum overall grade average of 2.4 are graduated *With Honor*; a 2.6 *With High Honor*; and a 2.8 *With Highest Honor*. This distinction of high academic achievement is placed on the student's diploma and on his permanent record.

The grade average for graduation honors must be achieved on Auburn University course work. A student with transfer credits must have the required grade average on all course work attempted elsewhere as well as on Auburn University courses. Grades of S or U and noncredit courses are not used in the calculations.

At least 45 hours and three quarters in residence at Auburn University are required for graduation honors.

Student Services and Programs

MATTERS AFFECTING THE UNIVERSITY experience of students outside the classroom and laboratory and not directly connected with the students' formal academic programs are the concerns of the Dean of Student Affairs and the Dean of Women. The Dean of Student Affairs and his staff are concerned with housing for men and for married students, off-campus housing, student publications, the Student Development Services, and the Auburn Union. They also serve as advisers to campus organizations, fraternities, and the Student Government Association. The Office of Student Affairs is in 304 Martin Hall.

The Dean of Women regards the well being of women students as her principal responsibility. She and her staff counsel women students; supervise women's housing; and serve as advisers to the sororities, to the honor societies for women, and to the Associated Women Students. Since the Dean is also Social Director, social functions are registered in her office, located in the Social Center.

Student Development Services

Professionally trained counselors provide confidential assistance in curriculum selection, career exploration, personal concerns, learning skills development, and legal matters. Other services include a study partners program as well as programs for married students and for international/minority students. These services are available in Mell Hall to current and prospective students, without cost.

Veterans Affairs

Under the sponsorship of Student Development Services and the U. S. Veterans Administration, the Veterans Affairs Office in Mell Hall provides information on benefits to veterans who attend Auburn University. Students on the GI Bill and students who are dependents of disabled veterans may receive help from this office which works with the VA on such matters as monthly checks, educational entitlement, certificates of eligibility, and other problems.

Placement Service

The University Placement Service assists, without charge, students and alumni in securing business and professional positions through its contacts with potential employers. Representatives of firms and agencies visit the campus each quarter for personal interviews with students. Seniors and graduate students who desire information and assistance should confer with the Director, 400 Martin Hall.

For information on employment while in University residence, see the section on Information for Prospective Students.

Bookstores

The University Bookstore, located in Haley Center, offers a full line of textbooks and other instructional materials. Alpha Phi Omega service fraternity sponsors a nonprofit bookstore in the Auburn Union Building where students may purchase and sell textbooks. There are also commercial book outlets in the city of Auburn.

Student Health Center

The mission of the Drake Student Health Center is to provide initial diagnostic services for illness and injury occurring while the student is enrolled in the University, and to provide immediate and follow-up treatment for most short-term illnesses. Health services are available to all regularly enrolled students at Auburn but are not provided for the dependents of married students.

The Health Center is not organized to function for complete medical care. It does, however, provide for office diagnosis, hospitalization at the Center for minor illnesses, and therapy, within these limits. These services, supported by a portion of the University Fee, supplement the student's regular medical program which should take care of major medical illnesses, surgery, obstetrics, psychiatric care, dental care, and regular or periodic physical examinations. It is thus recommended that the Student Government Association—sponsored health insurance or other insurance be carried to cover major medical services.

HOURS OF OPERATION

DURING QUARTER SESSION

The out-patient clinic is open from 8:00 a.m. to 4:30 p.m., each day, Monday through Friday, and 9:00 a.m. to 12:00 noon on Saturdays. Emergency treatment is available during all other hours, seven days per week, with a staff physician on call.

HOLIDAYS

The Health Center is closed from 5:00 p.m. on the day preceding an official University holiday until 7:00 a.m. on the day following the holiday.

BETWEEN QUARTERS

Starting at 7:00 a.m. on the day after graduation until the day before classes start the next quarter, only emergency out-patient treatment will be provided. The hours of operation will be 8:00 a.m. to 5:00 p.m., Monday through Friday. This service is available to those students participating in University-sponsored functions.

Insurance

The Student Government Association sponsors two Accident and Sickness Insurance Plans, which are available to all registered undergraduate and

graduate students. The plans provide maximum coverage at minimum cost. Additional information on insurance is available in the Off-Campus Housing Office, 315 Martin Hall.

Special Clinics

The Speech and Hearing Clinic of the Department of Speech Communication provides service for students with speech or hearing problems, although the clinic is primarily a teaching facility. The Reading Clinic, also in Haley Center, offers aid to those with reading difficulties. The Language Laboratory of the Foreign Languages Department extends help to students for whom English is a second language.

Housing

The following regulations are in effect for Auburn University students at the time of publication of this catalog. As the University moves toward implementing the requirements of Title IX of the Educational Amendments of 1972 as they apply to student housing, certain changes in these regulations may occur. Every effort will be made to publicize changes as far in advance as possible.

Auburn University maintains living quarters for some 4,000 of its students in campus residence halls and apartments; the majority of those enrolled live off campus. Rooms for approximately 844 men and 2,800 women are available, and 384 campus apartments provide housing for married students.

Some of the dormitories are equipped with a private telephone in each room for local calls. Bills for all long distance calls must be paid to telephone company by student promptly or the telephone may be disconnected.

ROOM RENT is due and payable in full at the beginning of each quarter. A late fee of \$5.00 will be charged on payments made during the first five days of classes. A late fee of \$10.00 will be charged on payments made after the fifth day of classes. However, when deemed necessary, arrangements may be made with the Cashier in the Housing Office for payment of one-half the room rent at the beginning of the quarter and the other one-half by mid-quarter.

Magnolia and Bullard Dormitories, accommodating 700 men, contain a dining hall, indoor recreation area, and a post office. Each room in Magnolia, designed primarily for double occupancy, is air conditioned and equipped with a private telephone for local calls. Bullard's rooms, designed primarily for single occupancy, are not air conditioned. In both dormitories groups of 25 to 35 students make up a living unit, each with a resident adviser. A third residence for men, *Sewell Hall*, houses scholarship athletes only.

Men who have been notified of tentative admission by the University are eligible to apply for housing in Magnolia Dormitories. Requests for room reservations should be addressed to the Director, Magnolia Dormitories. Details are covered in the Housing Agreement, which the applicant will receive, on request. A completed Housing Agreement, with a \$50 check payable to Auburn University for room reservation deposit, should be returned promptly by the applicant. The deposit is held to cover possible loss or damage to property, and does not apply to room rent. The Housing Agreement outlines refund rules.

Quarterly room rents in Magnolia Dormitories are as follows:

For those on meal contracts

	Double Occupancy	Single Occupancy
Magnolia	\$130.00	\$195.00
Bullard	95.00	135.00

For those not on meal contracts

	Double Occupancy	Single Occupancy
Magnolia	\$145.00	\$210.00
Bullard	110.00	150.00

Room rent is payable prior to the first day of classes each quarter.

Auburn University provides 24 residence halls for women students. A head resident is in charge of each dormitory and serves as counselor to the students as well as dormitory hostess. Food service is available at the War Eagle Cafeteria, and Alumni, Terrell, and Magnolia Halls. For details on food plans, see the section below on Food Services.

Students who do not contract for a quarterly meal plan will be assessed an additional \$15.00 per quarter on room rent.

Room rentals per quarter range from \$125.00 to \$160.00 for those women who purchase a quarterly University meal plan. For individuals who do not contract for meals, the rentals range from \$140.00 to \$175.00. If a student moves into a room at the first of the quarter and then withdraws from the dormitory, she is charged a minimum of one-third of the room rent for the quarter.

The women's dormitories consist of the main dormitory group and the South dormitories. In the main group are the following residence halls, together with quarterly rental rates. (The figures do not include the \$15.00 surcharge assessed those who do not contract for meals.)

I	Elizabeth Harper Hall	\$160	VIII	Ella Lupton Hall	\$160
II	Kate Conway Broun Hall	160	IX	Helen Keller Hall	140
III	Willie Little Hall	160	X	Marie Bankhead Owen Hall	140
IV	Kate Teague Hall	160	XII	Dana King Gatchell Hall	*
V	Letitia Dowdell Hall	140		Alumni Hall	125
VI	Allie Glenn Hall	140		Auburn Hall	125
VII	Mary Lane Hall	160		Noble Hall	150

Each of the dormitories I through X houses 100 girls and is arranged in suites consisting of two double rooms with connecting bath. The rooms contain twin beds and other necessary furnishings, including a private telephone for local calls. Students provide their own linens and other items they may wish to use in their rooms. Gatchell Hall* is a cooperative dormitory where women prepare their meals and do their cleaning; the cost of board and room is thus reduced. Alumni, Auburn and Noble Halls, housing respectively 100, 182, and 170 women, have community baths on each floor. The furnishings are the same as those in dormitories I-X. Some of the above residence halls are air conditioned.

Across from the Auburn Union is located the Social Center in which the Dean of Women, Assistant Dean of Women, and other staff members have offices. There is also a post office in the area. Most of the women's dormitories in the main group are situated near the Center.

The South dormitory group, together with quarterly rentals, is listed below:

A	<i>Mollie Hollifield Hall</i>	\$160	F	<i>Dixie Bibb Graves Hall</i>	\$160
B	<i>Annie Smith Duncan Hall</i>	160	G	<i>Camille Early Dowell Hall</i>	160
C	<i>Marguerite Toomer Hall</i>	160	H	<i>Stella White Knapp Hall</i>	160
D	<i>Zoe Dobbs Hall</i>	160	J	<i>Mary Boyd Hall</i>	160
E	<i>Berta Dunn Hall</i>	160	K	<i>Sara Sasnett Hall</i>	160

The South dormitories consist of eight three-story halls each housing 110 women and two six-story halls (Boyd and Sasnett) each housing 216. These air conditioned dormitories are arranged in suites, with connecting bath between each two double rooms. The rooms contain twin beds and all other necessary furnishings. Students provide their own linens and other items they may wish to use in their rooms. The rental includes the cost of a private telephone for local calls. In the area is located an administration building providing offices for the Head of Women's Housing, an Assistant to the Dean of Women, staff, and the post office for the area.

Because of the large number of requests for rooms in the Women's Dormitories for the Fall Quarter, it is necessary to assign three girls to some of the rooms in the dormitories which have suites. Only one room in a suite is tripled. Each girl living in a triple for the Fall Quarter receives a refund of a portion of her room rent.

Dormitory reservation forms will be mailed to the applicant at the time she is accepted for admission to the University. This form must be returned to the Head of Women's Housing with a deposit of \$50.00 within three weeks of the date of acceptance. No room reservation is binding until this fee has been received. The deposit is held to cover possible loss or damage to University property, and does not apply to room rent.

Refund of room reservation fees will be made under the following conditions:

1. When reservations for the Fall Quarter are cancelled on or before August 1.
2. When reservations for the Winter Quarter are cancelled on or before December 1.
3. When reservations for the Spring Quarter are cancelled on or before March 1.
4. When reservations for the Summer Quarter are cancelled on or before May 15.
5. When room is vacated at the end of a quarter and no further reservation is desired, if notice has been given by the deadline stated above and if there has been no loss or damage to property.
6. When a student is prevented from entering because of scholastic deficiencies.
7. When personal illness or physical injury necessitates cancellation of reservations.

A room reservation is not valid unless the applicant has been admitted to Auburn University.

Room rent is due and payable in full at the beginning of each quarter. Penalties for late payment are assessed. (See the section on Fees and Charges under Information for Prospective Students.)

Married Students Housing

Caroline Draughton Village is maintained by Auburn University to provide housing for married, full time students, or previously married students with children. Included in the 384 apartments are one and two bedroom units with or without air conditioning.

Apartments have all electric kitchens, furnished living rooms and bedrooms, spacious closets, ample cabinets, and baths with shower-tub combinations. The rent of \$93.00 to \$108.00 covers heat, water, solid waste disposal, and cable television. For additional information, write to Housing Manager, 901 W. Thach Avenue, Auburn, Alabama 36830.

Off-Campus Housing

Privately-owned dormitories, fraternities, apartments, houses, and mobile homes in the Auburn community also provide living quarters. The University maintains a current file of available accommodations in the Off-Campus Housing Office, 315 Martin Hall.

The University neither inspects nor approves off-campus housing. The facilities must, however, conform to federal regulations and to the local code of health and safety regulations. The same general rules of student conduct apply in housing both on and off campus.

Food Services

University operated air conditioned food service facilities are conveniently located near all residence halls. The Food Service Department employs a highly skilled dietetic and management staff to insure the highest quality meals at the lowest possible price.

Optional Meal Plans

A variety of optional meal plans are available through meal contracts, the charge plan and cash. Meal contract options and deposit agreements are binding for one quarter only.

Meal Contract Plan

The meal contract is non-inflationary, binding and non-transferrable for the quarter it is in effect.

The three options available are—the *Seven-Day Plan*, Monday through Sunday noon (20 meals); the *Five-Day Plan*, Monday through Friday noon (14 meals); and the *Quarter 99 Plan*, Monday through Sunday noon (any 99 meals per quarter). Meal contracts are not in effect on official University holidays.

Seven-Day Plan—\$245 plus tax
\$1.15 per meal average

Five-Day Plan—\$220 plus tax
\$1.44 per meal average

Quarter 99 Plan—\$215 plus tax
\$2.17 per meal average

Complete A La Carte Meal—\$2.25-3.00
or average \$2.60

Many students overlook the contract plan because they feel they will not eat all 20 meals each week of the quarter. We suggest looking at the entire plan instead of on a weekly basis. For example, assume a student misses six weekends per quarter or 36 meals. The price per meal consumed is still only \$1.38 ($\$245, \text{price/quarter} \div 177, \text{meals consumed}$), which is still under the other contracts and far less than the average ala carte price. In addition, meals will be available for the weekends students are on campus.

Three dining halls—Terrell (north dining room only), Magnolia and Alumni—cater to the meal contract plan. To insure enough to eat, our second-helpings policy is in effect daily at these dining halls on all food items except some meats or entree selections.

The Chef's Club

The *Chef's Club* is our new food charge plan that you can use in all food service facilities on campus.

For your convenience, two options of the *Chef's Club* are available. You can receive credit approval by furnishing two credit references or your parent's notarized signature as co-signer, or you can place a \$225 deposit per quarter with us.

Chef's Club cards are issued during the year to those who have established credit with Food Services and are valid until the end of the following Summer Quarter. Letters will be sent to all active members during Summer Quarter to facilitate renewing his or her plan for Fall Quarter.

The minimum amount that can be charged at one time is 30 cents, the maximum, \$9.00. A card holder may charge guest meals also. Use of this card is restricted to the registered holder. Students violating the privileges of the card will be subject to University discipline.

Students who deposited \$225 with the *Chef's Club* last quarter have satisfactorily established credit with Food Services and can retain their cards on the monthly billing system. However, a new deposit must be made at the beginning of each quarter to save the additional charge on dormitory rent.

Options

\$225 DEPOSIT OPTION—This option was developed to be used in lieu of a meal contract plan for those students wishing to save the \$15 additional quarterly charge on University dormitory rent.

The money deposit is placed in the student's account and meals are charged against this amount. Any money remaining in the account at the end of the quarter will be forfeited to the University by the student. If the balance exceeds the \$225 deposit at the end of the quarter, the student must pay the balance within 10 days of the billing date.

MONTHLY BILLING OPTION—Any full-time student or faculty/staff member is eligible to join the *Chef's Club*. Applications are available in The Chef's Club office located in the Auburn Union. There is no membership fee. You will be billed monthly for what you have eaten. You must pay the total amount due within 10 days. There will be a service charge for replacement of lost cards and returned checks.

Many students have selected a Meal Contract Plan and also a *Chef's Club* card with Monthly Billing Option to charge guest meals and weekend meals.

Cash

Cash is accepted at all the dining halls during normal hours of operation, but after thorough investigation on your part, we're sure you'll find that a Meal Contract Plan will definitely save you money on the average cost per meal and on dormitory rent.

Additional details of the optional meal plan contracts, *Chef's Club* charge plans and hours of service are available through the offices of both Housing and Food Services.

Student Government Association

Upon enrollment at Auburn University, each student becomes a member of the Student Government Association, the official organization of the student body. All students are urged to participate in the Association or SGA, as it is called, and to become involved in the political life of the campus.

SGA is organized into executive, legislative, and judicial branches. Each of the ten Schools of the University is represented in the Student Senate. One of that body's powers is the selection of a non-voting student representative to attend meetings of Auburn University's Board of Trustees. The judiciary is made up of a presiding justice and six associates. Officers and senators are chosen in the Spring Quarter by general election. The Student Government Constitution and Laws, published in the *Tiger Cub*, detail the functioning of student government.

Student Publications

The following publications, supported by Student Activity fees, are subject to supervision by the Board of Student Communications:

- The Auburn Circle*, a quarterly literary magazine
- The Glomerata*, the yearbook issued each spring
- The Auburn Plainsman*, the weekly student newspaper
- The Tiger Cub*, annual student handbook

Other publications include the *Auburn Design*, a booklet published yearly for and by students in Industrial Design; the *Auburn Veterinarian*, a quarterly published by and for students in Veterinary Medicine; and the *Auburn Pharmacist*, issued once a quarter by the School of Pharmacy. The latter three do not derive support from the Student Activity fee.

The Auburn Union

The Auburn Union serves as a focal point for co-curricular student activities as well as other campus programs. The Union houses the Plainsman, Glomerata, Auburn Circle, Alpha Phi Omega Bookstore, SGA, IFC, AWS, Panhellenic Council, University Program Council, Alumni Association, War Eagle Cafeteria, a recreation room, a typing room, a ceramics room, woodworking hobby shop, and an art gallery. It also provides lockers for commuters, a 24 hour banking service, several lounge areas and an assortment of meeting and banquet rooms. In addition a University-wide information center is maintained at the main desk.

University Program Council

The University Program Council serves as a clearing house for campus programs as well as areas providing directly a range of programs and entertainment through the following committees: 1) Major entertainment, 2) Horizons, 3) Publicity, 4) Special Events, 5) Fine Arts, and 6) Recreation. In addition this experience in planning and executing programs offers students the opportunity to enhance their personal growth and development.

Music, Theatre, Culture

Among the special events of the year at Auburn University are popular and classical concerts, touring play productions, lectures by political figures, news commentators, specialists, and prominent scholars, traveling and local shows at the art galleries, opera, ballet, and films. Many of these presentations are free.

Among opportunities for those who perform in musical groups are the University Concert Choir, the Choral Union, University Singers, the Marching and Concert Bands, the University Orchestra, and Opera Workshop.

Auburn University Theatre offers eight or nine productions each year, and students are welcome to audition for any production. Priority in casting is, however, given to theatre majors and minors.

The University Dance Council sponsors various dance events throughout the year, presenting a dance concert in the spring, and going on tour in fall and spring. Membership is open to all who are interested in promoting dance. The Dance Studios are in Memorial Coliseum.

Programs produced in the Auburn Studio of the Alabama Public Television Network are seen throughout the state on the Alabama ETV network. There is also radio station WEGL on campus, operated by students.

Intramural Sports

The University offers to its students a well rounded program of intramural athletics and provides a variety of facilities for recreation. Healthful sports, good sportsmanship, and friendly competition are stressed, and all students are urged to participate in recreational activities.

Regular tournaments are offered in seasonal team and individual sports. The intramural program operates services in the Student Activities Building where students may check out recreation equipment. For additional information, consult the *Tiger Cub*.

ORGANIZATIONS

National Honor Societies

The following members of the Association of College Honor Societies have established chapters at Auburn:

Alpha Epsilon Delta (Pre-Medicine)	Phi Alpha Theta (History)
Alpha Kappa Delta (Sociology)	Phi Eta Sigma (Scholarship—Freshmen)
Alpha Lambda Delta (Freshman Scholarship)	Phi Kappa Phi (Scholarship—Seniors)
Alpha Pi Mu (Industrial Engineering)	Pi Delta Phi (French)
Chi Epsilon (Civil Engineering)	Pi Sigma Alpha (Political Science)
Delta Sigma Rho-Tau Kappa Alpha (Forensics)	Pi Tau Sigma (Mechanical—Aerospace Engineering)
Eta Kappa Nu (Electrical Engineering)	Psi Chi (Psychology)
Mortar Board (Student Leadership)	Rho Chi (Pharmacy)
Omega Chi Epsilon (Chemical Engineering)	Sigma Delta Pi (Spanish)
Omicron Delta Kappa (National Leadership)	Sigma Gamma Tau (Aerospace Engineering)
Omicron Delta Epsilon (Economics)	Sigma Pi Sigma (Physics)
Omicron Nu (Home Economics)	Tau Beta Pi (Engineering)
	Xi Sigma Pi (Forestry)

National Recognition Societies

The following national societies have chapters established at Auburn:

*Alpha Phi Omega (Campus Service)	Omicron Kappa Pi (Architecture)
Alpha Psi Omega (Theatre)	Phi Psi (Textiles)
Alpha Zeta (Agriculture)	Phi Zeta (Veterinary Medicine)
Arnold Air Society (Air Force ROTC)	Scabbard and Blade (Military)
*Angel Flight (AFROTC Coed Auxiliary)	Semper Fidelis (Marine Corps ROTC)
Block and Bridle (Animal Science)	Sigma Alpha Eta (Speech Pathology)
*Capers (Army ROTC Coed Auxiliary)	Sigma Gamma Epsilon (Geology)
*Cwens (Student Leadership—Sophomore Women)	Sigma Lambda Chi (Building Construction)
Disc and Diamonds (Army ROTC)	Sigma Tau Delta (English)
Gamma Sigma Delta (Agriculture)	Steerage (Navy ROTC)
Gamma Sigma Sigma (Campus Service)	Pershing Rifles (Air Force and Army Basic Cadets)
Kappa Delta Pi (Education)	Pi Mu Epsilon (Mathematics)

Social Fraternities

Alpha Epsilon Pi	Omega Tau Sigma (professional)
Alpha Gamma Rho	Phi Delta Theta
Alpha Psi (professional)	Phi Gamma Delta
Alpha Tau Omega	Phi Kappa Psi
Beta Theta Pi	Pi Kappa Tau
Chi Phi	Pi Kappa Alpha
Delta Chi	Pi Kappa Phi
Delta Sigma Phi	Sigma Alpha Epsilon
Delta Tau Delta	Sigma Chi
FarmHouse	Sigma Nu
Kappa Alpha Order	Sigma Phi Epsilon
Kappa Alpha Psi (colony)	Sigma Pi
Kappa Sigma	Tau Kappa Epsilon
Lambda Chi Alpha	Theta Chi
Omega Psi Phi	Theta Xi

The Interfraternity Council coordinates the relationships between the member fraternities.

*Will lose university recognition July 21, 1976, unless constitution is changed to permit membership of both sexes.

Sororities

Alpha Chi Omega
Alpha Delta Pi
Alpha Gamma Delta
Alpha Omicron Pi
Chi Omega
Delta Delta Delta
Delta Gamma
Delta Sigma Theta

Delta Zeta
Gamma Phi Beta
Kappa Alpha Theta
Kappa Delta
Kappa Kappa Gamma
Phi Mu
Pi Beta Phi

The Pan-Hellenic Council regulates the activities of the sororities.

Leadership and service organizations, sports clubs, religious organizations, and departmental and professional groups are listed in the student handbook, *Tiger Cub*.

Discipline

Auburn University establishes and enforces only those rules and regulations for conduct as are needed to maintain the well-being of the individual student and the University community. The student, in registering at the University, agrees to conform with its regulations. He is subject to disciplinary action if he violates any section of the Code of Student Discipline, which appears in full in the student handbook, *Tiger Cub*. Enrollment in no way exempts any student from penalty in case of conviction by public authorities for commission of an illegal act.

Vehicle Registration

Registration of vehicles, including bicycles, is a part of the enrollment procedure for all students at the beginning of Fall Quarter.

Students who bring unregistered vehicles, including bicycles, to campus after the Fall enrollment period must register them at once at the University Security Office. Failure to register a vehicle, to use the proper decal, and to park in the proper zone will subject the operator to certain penalties.

Freshmen may bring autos to Auburn, but cannot operate them on campus during certain hours unless commuting. Because of the parking situation on campus and in Auburn, students are not encouraged to bring automobiles unless absolutely required for commuting.

The regulations stated above are subject to modification by the beginning of the Fall Quarter. Specific and current information on parking areas, regulations, controls, commuting, violations, and penalties may be found in "Parking and Traffic Regulations" and the "University Bicycle Code," available at the University Security Office.



School of Agriculture

R. DENNIS ROUSE, *Dean*

CHARLES F. SIMMONS, *Associate Dean*

STANLEY P. WILSON, *Assistant Dean*

E. V. SMITH, *Dean Emeritus*

THE SCHOOL OF AGRICULTURE prepares students for careers in agriculture and related professions. Courses provide a broad foundation in the basic sciences, a general knowledge of the applied sciences, and a reasonable number of cultural subjects. Most of the basic science courses are given in the freshman and sophomore years and serve as a basis for a better understanding of the applied or more practical subjects which are usually taken in the junior and senior years.

A curriculum is offered in Agricultural Science with majors in Agronomy and Soils, Animal and Dairy Sciences, Poultry Science, Horticulture, and Agricultural Journalism. Other curricula are offered in Agricultural Business and Economics; Agricultural Engineering; Biological Sciences, with majors in Botany, Fisheries Management, Wildlife Management, Entomology, Zoology, Microbiology, and Marine Biology; Food Science; Forest Management; Ornamental Horticulture; and Wood Technology. If a student is permitted to major in a field where the courses are not prescribed in the catalog he should consult with the head of the department concerned.

The School of Agriculture also furnishes the subject matter training in Agriculture for the curriculum for training teachers of Vocational Agriculture.

Transfer credit will not normally be allowed for any course passed with a grade lower than C at any other college or university.

Credit toward a degree in any curriculum in the School of Agriculture will not be allowed for a mathematics course at a level lower than that specified in the curriculum. However, students who are not prepared to take the prescribed courses may take lower level courses without degree credit.

Only on the basis of validating examinations by the student will transfer credit in agriculture subjects be accepted from colleges where instruction in these subjects is usually done by faculty members who do not hold graduate degrees in the major area of their instructional responsibilities. Arrangements for validating examinations must be made with the Dean of Agriculture in the first quarter of the student's enrollment in the School of Agriculture at Auburn and the examinations must be completed before the middle of the second quarter.

Agricultural Science (AG)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI	101	Prin. of Biology.....5	BI	102	Plant Biology.....5	CH	104	Fund. Chem. & Lab.....5
MH	160	Pre-Cal. w. Trig.....5	CH	103	Fund. Chem. & Lab.....5	MH	161	An. Geom. & Cal.....5
EH	101	English Composition...3	EH	102	English Composition...3	EH	103	English Composition...3
HY	101	World History.....3	HY	102	World History.....3	HY	103	World History.....3
		Basic ROTC.....1			Basic ROTC.....1			Basic ROTC.....1

SOPHOMORE YEAR

ADS	200	Intr. An. & Dairy Sciences.....5	AEC	202	Agr. Economics I.....5	ADS	204	An. Biochem. & Nut.....5
BI	103	Animal Biology.....5	AY	201	Prin. Grain Prod.....5	HF	201	Orchard Mgt.....5
PS	204	Fd. of Physics.....5	CH	207	Org. Chem. & Lab.....5			Elective.....5
		Basic ROTC.....1			Basic ROTC.....1			Basic ROTC.....1
PE	101	Fnds. of Phys. Ed.....1	PE	102	Begin. Swim.....1	PE		From Group II.....1

JUNIOR YEAR			
First Quarter		Second Quarter	
PH 201	Gen. Poultry.....5	BY 306	Fund. Plant Phys.....5
SC 202	App. Sp. Comm.....3	BY 309	Gen. Plant Path.....5
	Ag. Eng. Elective*.....5	JM 315	Technical Journalism.....3
	Elective.....5		Elective.....5
SENIOR YEAR			
		Third Quarter	
AY 401	Prin. Forage Prod.....5	AY 304	General Soils.....5
FY 313	Farm Forestry.....5	HF 308	Veg. Crops.....5
	Electives.....8		Ag. Eng. Elective*.....5
			Elective.....3
AEC 301	Ag. Marketing.....5	ADS 501	Swine Production.....5
AY 404	Fiber & Oil Crops.....5	AEC 501	Farm Management.....5
	Electives.....8	ZY 502	Econ. Entomology.....5
			Elective.....3

TOTAL—210 QUARTER HOURS

*To be selected from AN 350, 351, 352, and 353.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

Agronomy And Soils (AY)

Courses are designed to prepare Agronomy graduates for several major areas of endeavor: (1) the chemical industry, producers of fertilizers, herbicides, and other agricultural chemicals; (2) farm-advisory agencies such as soil testing laboratories and other private consultants; (3) public farm-advisory agencies such as the Agricultural Extension Service or the Soil Conservation Service; (4) research agencies of corporations, U.S. Department of Agriculture, colleges and universities, and State Agricultural Experiment Stations; (5) turfgrass industry.

FRESHMAN YEAR			
First Quarter		Second Quarter	
CH 103	Gen. Chem. & Lab.....5	BI 101	Prin. of Biology.....5
MH 160	Pre-Cal. w. Trig.....5	CH 104	Gen. Chem. & Lab.....5
EH 101	English Comp.....3	EH 102	English Comp.....3
HY 101	World History.....3	HY 102	World History.....3
	Basic ROTC†.....1		Basic ROTC†.....1
SOPHOMORE YEAR			
		Third Quarter	
ADS 204	An. Biochem. & Nutrition.....5	BI 102	Plant Biology.....5
BI 103	Animal Biol.....5	MH 161	An. Geom. & Cal.....5
CH 207	Organic Chem. & Lab.....5	EH 103	English Comp.....3
	Basic ROTC†.....1	HY 103	World History.....3
PE 101	Fund. of Phys. Ed.....1		Basic ROTC†.....1
AY 201	Prin. of Grain Prod.....5	AEC 202	Ag. Econ. I.....5
BY 300	General Microbiol.....5	AY 304	Gen. Soils.....5
GL 110	Physical Geology.....5	PS 200	Physics.....5
	Basic ROTC†.....1		Basic ROTC†.....1
PE 102	Begin. Swim.....1	PE 159	Golf.....1

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Crops and Soils Option

JUNIOR YEAR			
First Quarter		Second Quarter	
AN 350	Soil & Water Tech.....5	HF 308	Vegetable Crops.....5
ADS 200	Intr. An. & Dairy Science.....5	AY 506	Fertilizers & Soil Test.....5
BY 306	Fund. of Pl. Phys.....5		Elective.....8
SC 202	App. Sp. Comm.....3		
SENIOR YEAR			
		Third Quarter	
AEC 501	Farm Mgt.....5	AY 515	Soil Morph.....5
AY 401	Prin. of Forage Prod.....5	ZY 300	Genetics.....5
FY 313	Farm Forestry.....5	JM 315	Technical Journ.....3
	Elective.....3		Elective.....5
AY 404	Fiber & Oil Crops.....5	AY 502	Soil Fertility.....5
BY 309	Plant Pathology.....5	ZY 502	Econ. Ent.....5
	Elective.....8		Elective.....8

The student must take at least 5 hours from AN 351, 352, 353, and 354; and 9 hours of electives must come from Humanities and Fine Arts, and Social Sciences.

TOTAL—210 QUARTER HOURS

Turf Management Option

First Quarter			JUNIOR YEAR			Third Quarter		
			Second Quarter					
AN 350	Soil & Water Tech.	5	HF 221	Landscape Gardn.	5	AY 515	Soil Morph.	5
AY 315	Turfgrass Mgt.	5	AY 506	Fertilizers & Soil Test.	5	ZY 300	Genetics	5
BY 306	Fund. Plant Phys.	5		Elective	8	JM 315	Technical Journ.	3
SC 202	App. Sp. Comm.	3					Elective	5
			SENIOR YEAR					
AY 401	Prin. Forage Prod.	5	ACF 215	Gen. & Cost Acct.	5	AY 502	Soil Fertility	5
AY 514	Herbicides	5	BY 309	Plant Pathology	5	AY 499	Special Prob.	5
AY 516	Adv. Turf Mgt.	5	HF 521	Care & Maint. of	5	ZY 502	Econ. Ent.	5
	Elective	3		Ornamentals	5		Elective	3
				Elective	3			

The student must take at least 5 hours from AN 351, 352, 353, and 354; and 9 hours of electives must come from Humanities and Fine Arts, and Social Sciences.

TOTAL—210 QUARTER HOURS

Animal And Dairy Sciences (ADS)

This curriculum is designed to qualify the graduate in the basic and applied sciences in preparation for a future in the management of animal production units; for work with governmental and private agricultural agencies; for entering the field of processing dairy products and meats; for pursuit of scientific investigations in the field of animal agriculture; and for teaching.

Students may select a terminal degree option and prepare themselves to become (1) owners or managers of livestock farms; (2) feedlot managers; (3) livestock buyers and graders; (4) agricultural communication workers; and (5) representatives for animal agri-businesses.

Students are encouraged to take the graduate preparatory option if they anticipate the possibility of advanced study beyond the B.S. degree. Advanced study is necessary in preparing for most positions in teaching, extension education and research in universities and animal allied industries.

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
CH 103	Fund. of Chem. & Lab.	5	CH 104	Fund. of Chem. & Lab.	5	ADS 200	Intr. An. & Dairy Sci.	5
MH 160	Pre-Cal. w. Trig.	5	MH 161	An. Geom. & Cal.	5		Elective	5
ADS 101	Man's Food	3	EH 102	English Comp.	3	EH 103	English Comp.	3
EH 101	English Comp.	3	HY 101	World History	3	HY 102	World History	3
PE 101	Fnds. of Phys. Ed.	1	PE 102	Begin. Swim.	1		From Group II	1
	Basic ROTC†	1		Basic ROTC†	1		Basic ROTC†	1
			SOPHOMORE YEAR					
BI 101	Prin. of Biology	5	ADS 204	Animal Biochem. & Nutr.	5	BI 103	Animal Biology	5
CH 207	Organic Chem. & Lab.	5	BI 102	Plant Biology	5	BY 300	Gen. Microbiol.	5
ADS 210	Intr. Meat Sci. & Technol.	4	PG 212	Psychology	3	PS 200	Fnds. of Physics	5
HY 103	World History	3		Elective	3	ADS 309	Live An. Eval.	3
	Basic ROTC†	1		Basic ROTC†	1		Basic ROTC†	1
			JUNIOR YEAR					
ZY 251	Physiology	5	ADS 506	Animal Reprod.	5	ADS 503	Animal Breeding	5
ZY 300	Genetics	5	ADS 508	Adv. An. Nutr.	5	AEC 202	Ag. Econ. I	5
ADS 302	Feeds & Feeding	3	AY 304	General Soils	5	SC 211	Fund. Sp. Comm.	5
	Elective	5	JM 315	Technical Journalism	3		Elective	3
			SENIOR YEAR					
AEC 501	Farm Mgt.	5	ADS 420	Seminar	1	ADS 422	Animal Disease Control	5
ZY 502	Economic Ento.	5		Electives*	15		Elective*	11
	Electives*	6						

Total—210 Quarter Hours

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

*A minimum of 10 hours must be completed from among ADS 501, ADS 502 or ADS 504, and 10 hours from among AY 201 or AY 401 and AN 351, AN 352, AN 353 or 354. Other electives will be selected with the approval of the student's adviser and Dean.

Pre-Veterinary Medicine Option

The following curriculum is open only to students who are bona fide residents of the State of Alabama, and the nine quarters (158 quarter hours) meet the minimum requirements for admission to the School of Veterinary Medicine. Satisfactory completion of the remaining requirements of the Animal-Dairy Sciences curriculum or completion of two years in the Veterinary Medicine curriculum entitle the student to the B.S. degree in Animal and Dairy Sciences.

FRESHMAN YEAR		
First Quarter		
CH 103	Fund. of Chem. & Lab.	5
MH 160	Pre-Cal. w. Trig.	5
ADS 101	Man's Food	3
EH 101	English Comp.	3
PE 101	Fnds. of Physical Education	1
Second Quarter		
CH 104	Fund. of Chem. & Lab.	5
MH 161	An. Geom. & Cal.	5
EH 102	English Comp.	3
HY 101	World History	3
PE 102	Begin. Swim	1
Third Quarter		
ADS 200	Intr. An. & Dairy Sci.	5
CH 105	Fund. of Chem. & Lab.	5
EH 103	English Comp.	3
HY 102	World History	3
PE	From Group II	1
SOPHOMORE YEAR		
BI 101	Prin. of Biology	5
CH 207	Organic Chem. & Lab.	5
ADS 210	Intr. Meat Sci. & Technol.	4
HY 103	World History	3
PS 206	Intr. Physics	5
ZY 251	Physiology	5
ZY 300	Genetics	5
ADS 302	Feeds & Feeding	3
ADS 204	Animal Biochem. & Nutr.	5
BI 102	Plant Biology	5
CH 208	Organic Chem. & Lab.	5
EH 141	Medical Vocabulary	3
JUNIOR YEAR		
ADS 506	Animal Reprod.	5
ADS 508	Adv. An. Nutr.	5
AY 304	General Soils	5
JM 315	Technical Journalism	3
ADS 503	Animal Breeding	5
AEC 202	AG. Economics	5
PO 209	American Govt.	5
	Elective	3

(Students may choose 6 hours of basic military science, in consultation with their advisers).

See also, Curriculum in Pre-Veterinary Medicine (PV), School of Arts and Sciences.

Horticulture (HF)

The Horticulture major is designed to prepare the student for a future in the fruit or vegetable industry. Advanced study in Horticulture leads to professional positions in teaching, research, or extension.

FRESHMAN YEAR		
First Quarter		
BI 101	Prin. of Biology	5
MH 160	Pre-Cal. w. Trig.	5
EH 101	English Comp.	3
HF 101	Intr. to Hort.	1
PE 101	Basic ROTC [†]	1
	Fnds. of Phys. Ed.	1
Second Quarter		
BI 102	Plant Biology	5
EH 102	English Comp.	3
HY 101	World History	3
CH 103	Fund. Chem. & Lab.	5
	Basic ROTC [†]	1
PE 102	Begin. Swim	1
Third Quarter		
CH 104	Fund. Chem. & Lab.	5
MH 161	An. Geom. & Cal.	5
EH 103	English Comp.	3
HY 102	World History	3
	Basic ROTC [†]	1
PE	From Group II	1
SOPHOMORE YEAR		
AEC 202	Ag. Economic I.	5
GL 110	Physical Geology	5
HF 224	Plant Propagation	5
JM 315	Technical Journalism	3
	Basic ROTC [†]	1
CH 207	Organic Chem. & Lab.	5
HF 201	Orchard Mgt.	5
PS 200	Fnds. of Physics	5
	Basic ROTC [†]	1
JUNIOR YEAR		
AEC 301	Ag. Marketing	5
HF 308	Vegetable Crops	5
AY 304	General Soils	5
	Elective	3
AN 350	Soil and Water Technology	5
BY 306	Fund. of Plant Physiology	5
ZY 300	Genetics	5
	Elective	3
AY 402	Soil Fertility	5
BY 309	Plant Pathology	5
	Electives	8

SENIOR YEAR		
First Quarter		
AEC 501	Farm Management.....5	
Second Quarter		
HF 501	Storage, Packaging, and Marketing Veg. Crops.....3	
HF 504	Small Fruits.....5	
	Ag. Engineering Elective.....5	
	Elective.....3	
Third Quarter		
HF 506	Nut Culture.....5	
ZY 502	Economic Ento. Electives.....8	

TOTAL—210 QUARTER HOURS

*Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Poultry Science (PH)

A program is offered with the option of science or business. In most cases students anticipating study beyond the B.S. degree should choose electives for the science option. The electives in the business area provide the student opportunity to prepare for sales, service, and related agribusiness professions.

FRESHMAN YEAR		
First Quarter		
BI 101	Prin. of Biology.....5	
Second Quarter		
CH 103	Fund. of Chem. & Lab.....5	
MH 160	Pre-Cal. w. Trig.....5	
PE 101	Basic ROTC†.....1	
	Fnds. of Phys. Ed.....1	
Third Quarter		
BI 103	Animal Biology.....5	
GL 101	Intr. Geology I.....5	
HY 101	World History.....3	
EH 102	English Comp. Basic ROTC†.....1	
SOPHOMORE YEAR		
First Quarter		
CH 207	Organic Chem. & Lab.....5	
PH 201	General Poultry.....5	
HY 102	World History.....3	
EH 103	English Comp. Basic ROTC†.....1	
PE 102	Begin. Swim.....1	
Second Quarter		
AEC 202	Ag. Economics I.....5	
BY 100	Intr. Microbiol or biology*.....5	
HY 103	World History.....3	
SC 202	App. Sp. Comm. Basic ROTC†.....1	
PE	From Group II.....1	
Third Quarter		
ADS 204	An. Biochemistry & Nutrition.....5	
PS 200	Fnds. of Physics or Intr. Physics*.....5	
PG 212	Psychology.....3	
	Basic ROTC†.....1	
	Elective.....3	
JUNIOR YEAR		
First Quarter		
AY 304	General Soils.....5	
PH 302	Poultry Meat Prod.....3	
EH 304	Technical Writing.....3	
PA 211	Intr. to Deductive Logic.....3	
	Elective.....3	
Second Quarter		
RSY 261	Rural Sociology.....5	
ZY 300	Genetics.....5	
	Electives.....8	
Third Quarter		
AEC 301	Ag. Marketing.....5	
SC 273	Group Prob. Solv. through Discussion.....5	
	Electives.....8	
SENIOR YEAR		
First Quarter		
ZY 502	Economic Entomology or.....5	
PH 504	Poultry Mgt.....5	
PH 508	Control of Poultry Diseases & Parasites.....5	
	Electives.....8	
Second Quarter		
AEC 501	Farm Management.....5	
PH 511	Poultry & Marketing.....3	
	Electives.....9	

TOTAL—210 QUARTER HOURS

*Students choosing the science option should take BY 300 and PS 205 to prepare for more work in these areas.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Of the 47 hours of electives, 30 must be selected from the list that is available in the offices of the adviser and Dean and must be approved by them.

Agricultural Business And Economics (AEC)

The curriculum in Agricultural Business and Economics is for students who plan a career in business closely related to agriculture, and for those interested in the economics of agricultural production and marketing and in public policies affecting agriculture.

The curriculum combines both business and technical agricultural courses, and through selection of electives it provides an opportunity for students to emphasize training in agribusiness, in agricultural economics, in food science, in humanities, or in selected production fields.

The demand for graduates who have both business and applied agricultural training is increasing. In both public and private agencies, increasing attention to rural economic and social problems points to enlarged opportunities for qualified workers in teaching, research, sales, public relations, services, administration, and private employment in these fields. By electing appropriate courses in the food science management area, Agricultural Business and Economics students can prepare for management positions in the vast food industry.

First Quarter			FRESHMAN YEAR			Third Quarter		
MH 160	Pre-Cal w. Trig.	5	MH 161	An. Geom & Cal.	5	CH 104	Fund. Chem.	5
BI 101	Prin. of Biology	5	CH 103	Fund. Chem.	5		& Lab.	5
EH 101	English Comp.	3		& Lab.	5	BI 102	Plant Biology	5
HY 101	World History	3	EH 102	English Comp.	3	EH 103	English Comp.	5
PE 101	Fnds. of Phys. Ed.	1	HY 102	World History	3	HY 103	World History	3
	Basic ROTC†	1	PE 102	From Group II	1	PE 102	Begin. Swim.	1
				Basic ROTC†	1		Basic ROTC†	1
			SOPHOMORE YEAR					
ADS 204	Animal Biochem.		PO 209	Intr. Am. Govt.	5	EC 274	Bus. & Econ. Stat. I	5
	& Nutrition	5	PS 200	Foundations of		RSY 261	Rural Sociol.	5
AEC 202	Ag. Economics I	5		Physics	5	ACF 212	Prin. of Acct.	4
BI 103	Animal Biology	5	ACF 211	Prin. of Acct.	4		Basic ROTC†	1
	Basic ROTC†	1	SC 202	App. Sp. Comm.	3		Elective	3
				Basic ROTC†	1			
			JUNIOR YEAR					
ADS 200	Intr. An. & Dairy Sc.*	5	AEC 301	Ag. Marketing	5	AN 351	Ag. Mach. Tech. **	5
AY 307	Gen. Soils	5	PH 201	Gen. Poultry	5	EC 360	Money and Banking	5
EH 315	Bus. and Prof. Report		MN 241	Business Law	4	AEC 206	Ag. Econ. II	5
	Writing I	3		Elective	3		Electives	3
	Elective	3						
			SENIOR YEAR					
EC 456	Inter. Macro-econ.	5	AY 401	Forage Prod. or		AEC 501	Farm Management	5
AEC 510	Ag. Bus. Mgt.	3	AY 201	Grain Prod.	5	AEC 505	Ag. Policy	3
	Electives	10	FY 313	Farm Forestry	5		Electives	8
EH 415	Written Bus.		AEC 503	Ag. Prices	3			
	Comm.	3	AEC 490	Senior Seminar	1			
				Elective	5			

TOTAL—210 QUARTER HOURS

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

*ADS 501, ADS 502, or ADS 504 may be substituted.

**AEC 307, Agricultural Law, 5 cr. may be substituted for MN 241 or taken in addition as an elective.

***AN 350, AN 352, AN 353 or AN 354 may be substituted.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

Agricultural Engineering (AN)

This technical field trains engineers in the agricultural areas. The curriculum includes courses basic to all types of engineering, courses with particular emphasis on engineering problems in agriculture, and general agricultural courses. Students completing the curriculum have opportunities in many types of work where both engineering and agricultural knowledge are required.

The Agricultural Engineering curriculum is accredited by the Engineers' Council for Professional Development.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
BI 101	Prin. of Biology	5	CH 103	Gen. Chem	5	CH 104	Gen. Chem	5
EH 101	English Comp.	3		& Lab.	5	EH 102	English Comp.	3
TS 102	Graph. Comm.	2	BI 102	Plant Biology	5	HY 101	World History	3
	& Design	2	PE 102	Begin. Swim	1	PE 102	From Group II	1
PE 101	Fnds. of Phys. Ed.	1		Basic ROTC†	1		Basic ROTC†	1
	Basic ROTC†	1						

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.	5	PS 221	Gen. Physics II	4	ME 301	Thermodynamics I	4
BI 103	Animal Biology	5	ME 202	Engr. Mat. Science	3	PS 321	Dynamics I	4
PS 220	Gen. Physics I	4	ME 207	Strength of Mat.	3	PS 222	Gen. Physics II	4
ME 205	Appl. Mech. Stat.	4	EH 103	English Comp.	3	MH 265	Diff. Equat.	3
	Basic ROTC†	1	HY 102	World History	3	IE 204	Comp. Prog.	3
				Basic ROTC†	1		Basic ROTC†	1

JUNIOR YEAR

AN 303	Soil & Water	4	AEC 202	Ag. Econ. I	5	MH 362	Engr. Math I	3
EE 261	Circuit Anal. I	3	EE 263	Circuit Anal. II	4	AN 306	Elec. Systems	3
PS 320	Mod. Physics	3	AN 302	Mech. of Trac.	3	AN 304	Drain. & Irrig.	3
AN 301	Mech. of Farm	3		Power	3		Ag. Engr.	3
	Mach.	3	HY 103	World History	3		Elective	3
AN 307	Structures Des. I	3	AN 305	Ag. Proc. Engr.	3		Elec. Engr. Elective	3
ME 340	Fluid Mech.	3						

SENIOR YEAR

First Quarter			Second Quarter			Third Quarter		
AY 307	Gen. Soils	5	PA 202	Ethics & Soc.	5		Social & Hum.	8
SC 202	App. Sp. Comm.	3		Ag. Elective	5		Elective	5
	Engr. Electives	11		Ag. Engr. Elective	3		Ag. Elective	5
				Engr. Elective	3		Engr. Elective	3

TOTAL—210 QUARTER HOURS

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

SC 202 will be waived for students who complete a year of Advanced ROTC.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

Biological Sciences (BI)

Botany

The Botany major is for those students interested in fundamental plant science. The required courses serve as a basis for plant knowledge and future study. Proper elective selection prepares the student for various careers in the plant sciences. The curriculum is administered through a faculty advisory system for the best interests and needs of each student.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	BI 103	Animal Biology	5
MH 160	Pre-Cal. w. Trig.	5	MH 161	An. Geom. & Cal.	5	CH 103	Fund. Chem.	5
EH 101	English Comp.	3	EH 102	English Comp.	3		& Lab.	5
HY 101	World History	3	HY 102	World History	3	EH 103	English Comp.	3
	Basic ROTC†	1		Basic ROTC†	1	HY 103	World History	3
							Basic ROTC†	1

SOPHOMORE YEAR

CH 104	Fund. Chem	5	CH 104	Org. Chem. Elective	5	BY 300	Gen. Micro-	5
	Lab.	5	BY 309	Gen. Plant	5		biology I	5
ZY 300	Genetics	5		Pathology	5	CH	Chemistry Elective	5
EC 200	Gen. Economics or	5	GL 101	Intr. Geology I	5		Zoology Elective	5
AEC 202	Ag. Economics I	5		Basic ROTC†	1	ZY	Basic ROTC†	1
	Basic ROTC†	1	PE 102	Begin. Swim	1	PE	From Group II	1
PE 101	Fnds. of Physical Ed.	1						

JUNIOR YEAR

First Quarter	
SC 202	Appl. Sp. Comm. ....3
PA 210	Intr. Philosophy ....3
PS 205	Intr. Physics ....5
	Elective .....7

Second Quarter	
PS 206	Intr. Physics ....5
AY 304	General Soils ....3
EH	English Elective ....3
	Elective .....5

Third Quarter	
BY 306	Fund. Plant Physiology ....5
ZY 304	Gen. Entomology ....5
	Electives .....8

SENIOR YEAR

BY 513	Gen. Plant Ecology ....5
FL 121	French or
FL 151	German ....5
ZY	Zoology Elective ....5
	Elective .....3

BY 515	Plant Anatomy ....5
FL 122	French or
FL 152	German ....5
	Electives .....8

BY 506	Systematic Botany ....5
	Electives .....13

TOTAL—210 QUARTER HOURS

‡Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

A list of the recommended electives is available in the offices of the adviser and Dean and must be approved by them.

Microbiology

FRESHMAN YEAR

Fall Quarter	
BI 101	Prin. of Biol. ....5
MH 160	Pre-Cal. w. Trig. ....5
EH 101	English Comp. ....3
HY 101	World History ....3
	Basic ROTC ‡1

Winter Quarter	
BI 102	Plant Biol. ....5
MH 161	An. Geom. & Cal. ....5
EH 102	English Comp. ....3
HY 102	World History ....3
	Basic ROTC ‡1

Spring Quarter	
BI 103	Animal Biol. ....5
CH 103	Fund. Chem. & Lab. ....5
EH 103	English Comp. ....3
HY 103	World History ....3
	Basic ROTC ‡1

SOPHOMORE YEAR

CH 104	Fund. Chem. & Lab. ....5
AS 202	Ag. Econ. 1 or
EC 200	Gen. Economics ....5
PS 205	Intr. Physics ....5
PE 101	Fnds. of Phys. Ed. ....1
	Basic ROTC ‡1

CH 207	Org. Chem. & Lab. ....5
FL 121	French or
FL 151	German ....5
PS 206	Intr. Physics ....5
PE 102	Begin. Swim. ....1
	Basic ROTC ‡1

BY 300	Gen. Microbiol. I. ....5
CH 208	Org. Chem. ....5
FL 122	Elem. Fr. or
FL 152	Elem. German ....5
PE	From Group II ....1
	Basic ROTC ‡1

JUNIOR YEAR

CH 518	Biochemistry ....5
ZY 300	Genetics ....5
PA 210	Intr. Philosophy ....3
	Elective .....5

CH 519	Biochemistry ....5
SC 202	Appl. Sp. Comm. ....3
	Elective .....10

Electives18

SENIOR YEAR

54 elective hours to be arranged in consultation with adviser.

During Junior and Senior years, students must take 87 hrs. of electives. These may be selected from the following 3 groups with at least 30 from A, an additional 15 from A or B, and the remaining 42 from A, B, or C.

Group A

ADS 515	Food Microbiology ....5
BY 216	Intr. Biol. Computat. ....3
BY 302	Medical Microbiology ....5
BY 446	Clinical Microbiology ....5
BY 503	Microbial Taxonomy ....5
BY 505	Intr. Mycology ....5
BY 540	Microbial Physiology ....3
BY 540L	Microbial Phys. Lab. ....3
BY 542	Virology ....5
BY 543	Immunology ....5
BY 544	Microbiological Methods ....5

Group B

BY 215	Int. Biol. Stats. ....5
BY 309	Gen. Plant Pathology ....5
BY 508	Marine Microbiology ....7½
BY 511	Phycology ....5
BY 516	Biological Microscopy ....5
BY 541	Sanitary Microbiology ....5
CH 520	Clinical Biochemistry ....5
EH 304	Technical Writing ....3
FAA 516	Biological Productivity & Water Quality ....5
ZY 511	Parasitology ....5

Group C

University courses not included in Groups A or B. Selection to be determined in consultation with adviser.

Total—210 Quarter Hours

During the sophomore year students will develop a plan of study for the junior and senior years from lists of approved elective courses with the assistance and approval of their adviser and dean. Substitutions may be permitted to meet specific needs of individual students.

‡Students not taking Basic ROTC must elect six appropriate hours as replacement.

Zoological Sciences

Majors in zoological sciences are for students interested in careers in animal biology. One has the choice of five options: zoology, entomology, fisheries, marine biology, or wildlife, and degrees are offered in each option. During the

first two years, all students take the same subjects which emphasize the basic sciences and background courses. Thereafter, it is possible to elect courses to fit specific needs of the student in his or her option.

Entomology, Fisheries Management, Marine Biology, Wildlife Management, and Zoology

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI	101	Prin. of Biology.....5	BI	102	Plant Biology.....5	BI	103	Animal Biology.....5
CH	103	Fund. Chem. & Lab.....5	CH	104	Fund. Chem. & Lab.....5	MH	162	An. Geom. & Cal.....5
MH	160	Pre-Cal. w. Trig.....5	MH	161	An. Geom. & Cal.....5	PS	205	Intr. Physics.....5
PE	101	Fnds. of Phys. Ed.....1	PE	102	Begin. Swim.....1	PE		From Group II.....1
ZY	100	Zoological Orien.....0			Basic ROTC†.....1			Basic ROTC†.....1
		Basic ROTC†.....1						

SOPHOMORE YEAR

PS	206	Intr. Physics.....5	ZY	303	Syst. & Evolution.....5	CH	208	Organic Chem. & Lab.....5
ZY	300	Genetics.....5	CH	207	Organic Chem. & Lab.....5	ZY	306	Animal Ecology.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
HY	101	World History.....3	HY	102	World History.....3	HY	103	World History.....3
		Basic ROTC†.....1			Basic ROTC†.....1			Basic ROTC†.....1

JUNIOR YEAR

54 hours to be arranged in consultation with adviser.

SENIOR YEAR

54 hours to be arranged in consultation with adviser.

TOTAL HOURS REQUIRED—210 QUARTER HOURS

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

ADDITIONAL COURSES TO BE TAKEN BY ALL MAJORS

AEC	202	Ag. Economics I.....5	ZY	310	Cell Biology.....5
BY	300	General Microbiology.....5	ZY	511	Parasitology**.....5
SC	202	Appl. Sp. Comm.....3	ZY	521	or 522 Vert. Zoology**.....5
ZY	301	Comp. Anatomy.....5	ZY	524	Animal Physiology.....5
ZY	304	Gen. Entomology.....5	ZY	501	Invert. Zoology**.....5

*Except Fisheries

**Fisheries students will take BY 306 and FAA 438 in lieu of these courses

***Except Wildlife

The remaining requirements will include a minimum of 17 hours selected from the humanities and social sciences and at least 35 hours of group electives selected with the advice of the adviser and approval of the Dean. At least 10 hours of the group electives must be selected from the following botanical sciences: BY 306, 309, 506, 509, 513, 514, and 515. Recommended electives from the humanistic social sciences and group electives are available from the adviser and Dean. All students in Marine Biology must spend at least one quarter at a marine biology laboratory and take 15 to 18 hours of course work there.

Biological Sciences and Teacher Education

Students in the Biological Sciences curriculum with majors in either botanical or zoological sciences who wish also to prepare for certification as teachers in secondary schools may pursue the dual objective of completing the requirements for the B.S. degree in their particular Biological Sciences major and the requirements of the Teacher Education Program.

Students who choose the dual objective program should declare this intent to their departmental advisers by the end of their sophomore year if possible. Students pursuing the dual objective plan will be assigned an adviser in the School of Education who will advise them on all matters involving requirements for completing the Teacher Education Program. (See detailed discussion of admission and retention procedures for teacher education on page 124.)

In addition to the specific requirements, including group electives required for the B.S. in Zoological Sciences or Botany, these students must also include the following courses in their curriculum:

EH	Literature (253, 254, 255 or 260, 261, 262)	9
SY 201	Introduction to Sociology	5
	Freshman or Transfer Orientation	1
	Introduction to Laboratory Experiences	1
FED 213	Human Growth and Development	5
FED 214	Psychological Foundations of Education	5
FED 320	Social Foundations of Education	5
FED 480	Philosophical Foundations of Education	5
SED 405K	Teaching in Secondary School-Science	3
SED 410K	Program in Secondary School-Science	3
SED 425K	Professional Internship	15

None of the above courses may be used as group electives toward the degree in zoological sciences or botany, but literature, sociology, FED 213, or FED 214 may be used as needed as humanistic-social electives. Students should also elect 10 additional hours of chemistry to satisfy the requirements for a chemistry minor. Students in the Zoological Sciences curriculum must elect at least 5 hours of botanical sciences in addition to the 10 hours required of all zoological sciences majors.

Food Science (FS)

The Food Science curriculum, administered by an interdepartmental committee, is designed for those interested in the nation's gigantic food industry. Students may use their electives for a general program or for specializing in a commodity such as dairy, meat, fruit, or vegetable products. They may choose to emphasize business, technology, or science areas. K. M. Autrey, Room 242, Animal Sciences Building, is coordinator of this program.

A Food Industry Management option is available in the Department of Management, School of Business (page 108) for students with a primary interest in the management of food industries.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 103	Fund. of Chem. & Lab.	5	CH 104	Fund. of Chem. & Lab.	5	BI 101	Prin. of Biology	5
MH 160	Pre-Cal w. Trig.	5	MH 161	An. Geom. & Cal.	5	CH 207	Organic Chem & Lab.	5
ADS 101	Man's Food	3	EH 102	English Comp.	3	EH 103	English Comp.	3
EH 101	English Comp.	3	HY 101	World History	3	HY 102	World History	3
	Basic ROTC†	1		Basic ROTC†	1		Basic ROTC†	1

SOPHOMORE YEAR

AEC 202	Ag. Economics I or		ADS 204	Animal Biochem or		BI 103	Animal Biology	5
EC 200	Gen. Economics	5	NF 318	Nut. Biochem	5	BY 300	Gen. Microbiology	5
PS 204	Fnds. of Physics or		BI 102	Plant Biology	5	SC 211	Fund. of Sp. Comm.	5
PS 205	Intr. Physics	5	EH 315	Bus. & Prof. Report Writing	3	PE	From Group II	1
PG 211	Psychology	5	HF 200	Food Science Seminar I			Basic ROTC†	1
PE 101	Fnds. of Phys. Ed.	1	PE 102	Begin. Swim.	1			
	Basic ROTC†	1		Basic ROTC†	1			

JUNIOR YEAR

HF 340	Indust. Food Pres. Tech.	5	NF 372	Fund. of Nutrition	3	ADS 514	Food Microbiology	5
HF 545	Food Chem.	3		Electives*	15		Electives*	13
HY 103	World History	3						
	Electives	8						

First Quarter			SENIOR YEAR			Third Quarter		
Second Quarter			Third Quarter			Undergrad.		
HF 543	Food Analysis	5	ADS 515	Food Plant	3	ADS 420	Undergrad.	1
	& Qual. Control	5		Sanitation	3		Seminar	1
	Electives*	12		Electives*	15		Electives*	18

TOTAL—210 QUARTER HOURS

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

*The student will complete a minimum of 60 hours from a list of recommended electives that is available in the offices of the adviser and Dean and must be approved by them.

Forestry

Two curricula are offered in forestry, one in forest management and the other in wood technology. The former leads to the degree of Bachelor of Science in Forestry while the other leads to the degree of Bachelor of Science in Wood Technology. The Department also offers an honors program which leads to the degree of Bachelor of Science in Forestry (Honors Program) and a recreation option in the forest management curriculum.

The Department of Forestry is accredited by the Society of American Foresters.

Forest Management (FY)

First Quarter			Second Quarter			Third Quarter		
BI 101	Prin. of Biology	5	BI 102	Plant Biology	5	BI 103	Animal Biology	5
MH 160	Pre-Cal w. Trig.	5	MH 161	An. Geom. & Cal.	5	MH 151	Finite Math.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
FY 105	For. Convocation*	0	PE 102	Begin. Swim	1	PE	From Group II	1
PE 101	Fnds. of Phys. Ed.	1		Basic ROTC†	1		Basic ROTC†	1
	Basic ROTC†	1						

SOPHOMORE YEAR			SOPHOMORE YEAR			SOPHOMORE YEAR		
AEC 202	Ag. Economics I	5	CH 103	Fund. of Chem. & Lab.	5	CH 104	Fund. of Chem. & Lab.	5
FY 201	Dendrology	5	GL 110	Physical Geology	5	FY 204	For. Mensuration	5
FY 203	For. Cartography	3	SC 202	App. Sp. Comm.	3	PG 211	Psychology	5
IE 204	Comp. Program	3		Elective	3	EH 304	Technical Writing	3
	Basic ROTC†	1		Basic ROTC†	1		Basic ROTC†	1

JUNIOR YEAR			JUNIOR YEAR			JUNIOR YEAR		
ACF 215	Fund. Cost Acct.	5	AY 305	Gen. Soils	5	FY 307	Silvics II	5
ZY 300	Genetics	5	FY 303	Silvics I	5	FY 517	Photogrammetry	5
FY 205	Wood Indent.	3	FY 309	Sampling	5	FY 310	Adv. Mensur.	3
	Elective	3		Elective	3	FY 534	For. Policy & Law	3
							Elective	3

SUMMER CAMP**

FY 490	Field Mensuration	5
FY 491	For. Engineering	5
FY 403	For. Recreation	3
FY 493	For. Regeneration	3
FY 494	For. Tour	1

SENIOR YEAR

FY 520	Silviculture	5	FY 402	For. Fire Control	3	FY 507	For. Management	5
FY 408	Logging	3	FY 535	For. Prod. Mkt.	3	BY 310	For. Pathology	3
FY 537	For. Econ. I	3	FY 536	For. Watershed Mgt.	3	ZY 305	For. Entomology	3
FY 515	Range Mgt.	2	FY 538	For. Econ. II	3	FY 492	For. Site Eval.	2
	Electives	6	ZY 425	For. Wildlife Mgt.	3		Elective	3

TOTAL—227 QUARTER HOURS

*This course will be taken in all except summer quarters.

**Any approved course in public speaking may be substituted for SC 202. The requirement for SC 202 will be waived for students completing one year of advanced ROTC.

***Summer Camp involves 11 weeks and does not exactly correspond to the regular summer quarter calendar.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Recreation Option

Freshman and Sophomore years same as in Forest Management Curriculum

JUNIOR YEAR

First Quarter			Second Quarter			Third Quarter		
FY 460	Wildland Rec.		AY 305	Gen. Soils	5	BY 310	For. Pathology	3
	Phil. & Pol.	3	FY 303	Silvics I	5	FY 307	Silvics II	5
RSY 261	Rural Sociology	5	FY 309	Sampling	5	FY 517	Photogrammetry	5
	Elective	8		Elective	3	FY 461	Rec. Land Classif.	3
							Elective	3

SUMMER CAMP

FY 403	For. Recreation	3
FY 491	Forest Engineering	5
FY 493	For. Regeneration	3
FY 494	For. Tour	1
HF 327	Landscape Eng.	3

SENIOR YEAR

FY 515	Range Mgt.	2	FY 402	For. Fire Control	3	FY 507	For. Management	5
FY 520	Silviculture	5	FY 536	For. Watershed Mgt.	3	FY 534	For. Pol. & Law	3
FY 537	For. Econ. I	3	FY 538	For. Econ. II	3	FY 469	Rec. Site Mgt.	3
FAA 447	Mgt. of Streams & Lg. Impoundments	3	ZY 425	For. Wildlife Mgt.	3		Elective	5
	Elective	3		Electives	6			

TOTAL—225 QUARTER HOURS

Honors Program in Forestry

The Honors Program in Forestry provides able students opportunity to explore in depth areas in which they are interested, to prepare for graduate school, or to obtain a more rounded education. The program is flexible, permitting concentration of effort in areas of the student's choosing.

Students with at least five quarters remaining in the Forest Management curriculum and with a grade point average of 1.75 or better may apply for admission to the program.

JUNIOR YEAR

First Quarter		Second Quarter		Third Quarter	
Electives	16	AY 305	General Soils	FY 307	Silvics II
		FY 303	Silvics I	FY 521	For. Research Meth.*
		FY 309	Sampling		Electives
			Elective		

SENIOR YEAR

FY 520	Silviculture	5	FY 538	For. Econ. II	3	FY 507	For. Management	5
FY 537	For. Econ. I	3		Electives	15	FY 499	Senior Thesis	5
	Electives	10				FY 590	Seminar in For.	1
							Electives	6

TOTAL—210 QUARTER HOURS

*Any three or five hour course in statistics may be substituted for FY 421.

Twenty-five of the free elective hours are to be chosen under the supervision of the faculty adviser, so as to develop a distinct program leading to a predetermined goal.

Wood Technology (WT)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
CH 103	Fund. Chem. & Lab.	5	CH 104	Fund. of Chem. & Lab.	5	CH 105	Gen. Chem. & Lab.	5
MH 160	Pre-Cal w. Trig.	5	MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5
FY 105	For. Convocation*	0		Basic ROTC†	1		From Group II	1
	Basic ROTC†	1	PE 102	Begin. Swim	1		Basic ROTC†	1
PE 101	Fnds. of Phys. Ed.	1						

SOPHOMORE YEAR

First Quarter		
BI 101	Prin. of Biology	5
PS 205	Intr. Physics	5
MH 163	An. Geom. & Cal.	5
	Basic ROTC†	1

Second Quarter		
BI 102	Plant Biology	5
PS 206	Intr. Physics	5
ADS 204	An. Biochem. & Nut.	5
	Basic ROTC†	1

Third Quarter		
BI 103	Animal Biology	5
FY 206	Wood Measure**	3
TS 102	Graph. Comm. & Des.	2
FY 205	Wood Ident. & Uses	3
EH 304	Technical Writing	3
	Basic ROTC†	1

EC 200	Gen. Economics	5
FY 201	Dendrology	5
FY 311	Wood Anatomy**	5
SC 202	App. Sp. Comm.**	3

JUNIOR YEAR		
FY 532	Seasoning & Preserv.**	5
FY 521	For. Research Meth.***	3
	Electives	10

PG 211	Psychology	5
FY 533	Seas. & Preserv. Lab.	2
	Electives	10

FY 330	For. Products**	5
	Electives	13

SENIOR YEAR		
FY 525	Wood Glu. & Lam.**	5
	Electives	13

FY 531	Mech. Prop. of Wood**	5
	Electives	13

TOTAL—210 QUARTER HOURS

One minor, consisting of 30 hours in the area of Mathematics, Chemistry, Engineering, or Management is required. In addition, 10 hours in computer programming and 10 hours in statistics, including laboratory are to be selected from the electives. From the remaining elective hours, 10 are to be selected with the adviser in the general area of humanities. A student may always substitute a more intensive group of courses for one or more of the required courses, providing the same breadth of coverage is maintained. Minor courses to be selected from approved list in Dean's office.

As a part of the requirement for the degree with a major in wood technology the student must complete a minimum of three weeks of supervised tours of forest products industries. A satisfactory report on these tours is to be submitted to the department head by the beginning of the final quarter prior to graduation.

*This course to be taken in all except summer quarters.

**Alternate year offering.

***Any approved course in public speaking may be substituted for SC 202. The requirement for SC 202 will be waived for students completing one year of advanced ROTC.

****Any three or five hour course in statistics may be substituted for FY 421.

†Students may choose six hours of electives in lieu of Basic ROTC in consultation with their academic advisers.

Landscape And Ornamental Horticulture (OH)

The Landscape and Ornamental Horticulture curriculum provides professional and basic knowledge and develops basic skills in four areas: Florist Crop Production, Landscape Design, Nursery Corp Production, and Retail Flower Shop Management. By the end of the sophomore year the student will choose one of these areas as his major option, and will schedule the courses prescribed for that option in the junior and senior years.

FRESHMAN YEAR

First Quarter		
BI 101	Prin. Biology	5
MH 160	Pre-Cal W. Trig.	5
EH 101	English Comp	3
HF 101	Intr. Hort.	1
	Basic ROTC†	1
PE 101	Fnds. Phys. Ed.	1

Second Quarter		
BI 102	Plant Biology	5
CH 103	Fund. Chem. & Lab*	5
EH 102	English Comp	3
HY 101	World History	3
	Basic ROTC†	1
PE 102	Begin Swim	1

Third Quarter		
CH 104	Fund. Chem. & Lab*	5
MH 161	An. Geom. & Cal.	5
EH 103	English Comp	3
HY 102	World History	3
	Basic ROTC†	1
PE	From Group II	1

SOPHOMORE YEAR

BI 103	Animal Biology	5
HF 221	Landscape Gard.	5
SC 211	Fund. Speech Comm.	5
HY 103	World History	3
	Basic ROTC†	1

AEC 202	Ag. Economics I	5
SY 201	Intr. to Sociology	5
	Basic ROTC†	1
	Electives	5

CH 207	Organic Chem. & Lab.	5
HF 224	Plant Prop.	5
	Basic ROTC†	1
	Electives	5

JUNIOR YEAR

54 hours in selected option to be arranged in consultation with adviser.

SENIOR YEAR

53 hours in selected option to be arranged in consultation with adviser.

TOTAL HOURS REQUIRED—210 QUARTER HOURS

*Students not qualified to take CH 103 will take CH 101 in first quarter and will take CH 102 and CH 103L in their second quarter.

†Students may choose 6 hrs. of electives in lieu of Basic ROTC in consultation with their academic advisers.

ADDITIONAL COURSES TO BE TAKEN BY ALL OPTIONS

AY 304	General Soils	5	BY 506	Systematic Botany	5
AY 502	Soil Fertility or AY 506 Fertilizers & Soil Testing	5	EH 390	Advanced Composition	5
BY 306	Plant Physiology	5	HF 323	Ghse. Environ. Control	5
BY 309	Plant Pathology	5	ZY 502	Economic Entomology	5

REQUIRED ELECTIVES FOR VARIOUS OPTIONS

Florist Crop Production

Objective: To train students in production, marketing and management of floricultural crops.

The following courses, with credit hours shown, are required: ACF 211-Prin. of Acct.-4, HF 225-Flower Arranging-3, HF 308-Vegetable Crops-5, HF 522-Fund. of Floricultural Crop Prod.-5, HF 425-Flower Shop Management-5, MN 310-Prin. of Management-5, MN 241-Business Law-4, ZY 300-Genetics-5.

Landscape Design

The following courses with credit hours shown, are required: HF 521-Care & Maint. Orn. Plants-5, HF 523-Nursery Mgt.-5, MN 241-Business Law-4, AY 315-Turfgrass Mgt.-5, ten hours to be selected from the following 3 courses: HF 222-Trees-5, HF 223-Evergreen Shrubs & Vines-5, HF 321-Deciduous Shrubs & Vines-5; ten hours to be selected from the following 5 courses: HF 325-Landscape Planning of Home Grounds-5, HF 326-Landscape Planning of Public Grounds-5, HF 328-Landscape Construction-5, HF 424-Planting Design-5, HF 531-Adv. Landscape Gardening-4; and five hours to be selected from the following areas: AT 111 or 112 or 113-Fundamentals-5, AT 121-Fundamentals-5, AN 350-Soil and Water Technology-5.

Nursery Crop Production

Objective: To train students in production, marketing, and management of nursery products.

The following courses, with credit hours shown, are required: AY 315 Turfgrass Mgt.-5, HF 201-Orchard Management-5, HF 421-Care & Maint. Orn. Plants-5, HF 523-Nursery Mgt.-5, ZY 300-Genetics-5; ten hours to be selected from the following 3 courses: HF 222-Trees-5, HF 223-Evergreen Shrubs & Vines-5, HF 321-Deciduous Shrubs & Vines-5; and 4 hrs. to be selected from the following 2 courses: ACF 211-Prin. of Acct.-4, MN 241-Business Law-4.

Retail Flower Shop Management

Objective: To train students to be managers of retail flower shop operations. Both art and business management are involved.

The following courses, with credit hours shown, are required: ACF 211-Prin. of Acct.-4, HF 225-Flower Arranging-3, HF 522-Floricultural Crop Prod.-5, HF 425-Flower Shop Management-5, MN 310-Prin. of Management-5, MN 241-Business Law-4, MT 331-Prin. of Marketing-5, MT 433-Retail Store Management-5; plus 4 or 5 hrs. to be selected from the following 3 courses: ACF 212-Prin. of Acct.-4, MN 242-Business Law II-4, MT 537-Sales Management-5.

OTHER ELECTIVES

Additional electives to make a total of 210 hours in a given option are to be selected with the approval of the adviser and dean.



School of Architecture and Fine Arts

E. KEITH MCPHEETERS, *Dean*

THE SCHOOL OF ARCHITECTURE AND FINE ARTS includes the Departments of Architecture, Art, Building Science, Music and Theatre.

The Departments of Architecture and Building Science offer undergraduate degree curricula in Architecture, Interior Design, Industrial Design, and Building Science. The Department of Architecture also offers a graduate degree in Industrial Design. The primary objective of these programs is to educate professional practitioners for many aspects of the designed physical environment.

The Departments of Art, Music and Theatre offer curricula in Visual Arts, Music and Theatre. The Art Department also offers a graduate degree in Fine Arts; and the Music Department offers a graduate degree in Music. The Departments of Art, Music, and Theatre cooperate with the School of Education in the education of teaching professionals. The objective of these programs is to develop creative and professionally knowledgeable practitioners and teachers in the arts and to provide a foundation for continuing professional development.

Department Of Architecture

The Department of Architecture was established in 1907 and is the oldest in the South. Courses are offered leading to the degrees Bachelor of Science in Environmental Design, Bachelor of Architecture, (Architectural Design Option, Architectural Management Option or Architectural Technology Option), Bachelor of Interior Design, Bachelor of Industrial Design, and Master of Industrial Design.

Admission

Acceptance for admission to professional curricula in architecture, and interior design, will be determined by the Admissions Committee in the Department of Architecture on the basis of an evaluation of the candidate's test scores and academic records. The Committee will also consider any examples of professional or art work which the candidate may wish to submit.

Transfer

Transfer students from non-architectural programs will be required to begin the Design sequence at a level not higher than first quarter, second year. Transfer students from accredited schools of Architecture will be required to present examples of their work for evaluation by the Admissions Committee. The Committee will determine the level at which the student will enter the Design Sequence.

Architecture

The Curriculum in Architecture prepares the student to take his place as a citizen and as a professional. Since the building industry is one of the three largest in the nation in terms of expenditure and employment, the architect today must accept a concern for the improvement of the physical environment and assume the leadership in evolving effective procedures toward this end. Therefore, the architect must bring to his work technical knowledge, social insight, creative imagination, and individual integrity.

The Bachelor of Science in Environmental Design (a non-professional degree) is awarded upon successful completion of the first four years of the curriculum in Architecture. The Bachelor of Architecture (the professional degree) is awarded upon completion of the fifth year in either the Architectural Design, Architectural Management or Architectural Technology options as shown below.

The Department is a member of the Association of Collegiate Schools of Architecture, and the curriculum in Architecture is accredited by the National Architectural Accrediting Board. The Architecture curriculum prepares the student for the office experience and the examination required by the registration laws to practice architecture as well as for examination by the National Council of Architectural Registration Boards.

Student work may be retained by the Department for indefinite periods to be used for exhibition or for record purposes.

The Cooperative Education Program is also offered. For more information, refer to page 27.

Special Problems in Architecture

Beginning in the third year of the curriculum in Architecture, students capable of independent study may, on recommendation of the faculty and with approval of the head of the department, pursue an area of special interest. This may be a group or team effort under the direction of the faculty. Each student or team shall submit a plan of study for approval before commencing the work. The student may earn a maximum of 15 hours of credit in independent study, a special project, or in research. After approval, students shall enroll in AR 495, Special Problems, for up to five hours in any one quarter. Evaluation of the work will be by faculty jury.

Curriculum in Architecture (AR)

FIRST YEAR			
First Quarter		Second Quarter	
AR 110	Design Fund.....5	AR 111	Design Fund.....5
MH 160	Pre Cal w/Trig.....5	MH 161	An. Geom. & Cal.....5
EH 101	English Comp.....3	EH 102	English Comp.....3
	History Elective*.....3		History Elective*.....3
PE	Physical Education.....1	PE	Physical Education.....1
Third Quarter		Fourth Quarter	
AR 112	Design Fund.....5	AR 112	Design Fund.....5
MH 162	An. Geom. & Cal**.....5	MH 162	An. Geom. & Cal**.....5
EH 103	English Comp.....3	EH 103	English Comp.....3
	History Elective*.....3		History Elective*.....3
PE	Physical Education.....1	PE	Physical Education.....1
SECOND YEAR			
AR 201	Arch. Design.....5	AR 202	Arch. Design.....5
PS 200	Physics.....5		Nat. Sci. Elective.....5
AR 261	Hist. & Theo. Arch.....3	SY 201	Sociology.....5
	Elective.....5	AR 262	Hist. & Theo. Arch.....3
THIRD YEAR			
AR 301	Arch. Design.....5	AR 302	Arch. Design.....5
BSC 311	Strgth. of Matl.....5	BSC 314	Reinf. Concrete.....5
PG 212	Psychology.....3	EH 304	Tech. Writing***.....3
ACF 340	Personal Finance.....3	EC 206	Socio-Economics.....3
	Elective.....3		
AR 303	Arch. Design.....5	AR 303	Arch. Design.....5
BSC 315	Arch. Struc.....5	BSC 315	Arch. Struc.....5
AR 474	Intr. Ur. Plan.....3	AR 474	Intr. Ur. Plan.....3
	Elective.....4		Elective.....4

FOURTH YEAR

First Quarter			Second Quarter			Third Quarter		
AR 401	Arch. Design	5	AR 402	Arch. Design	5	AR 403	Arch. Design	5
MN 310	Prin. Manag.	5	AR 481	Computers in Arch.	3	BSC 453	Building Equip. II	3
AR 475	Urban Design	3	BSC 452	Building Equip.	3	AR 471	Professional Prac.	3
	Elective	5	AR	Seminar	3		Elective	3
				Elective	3		Elective	3

BACHELOR OF SCIENCE IN ENVIRONMENTAL DESIGN

TOTAL-209 QUARTER HOURS

Note: The professional degree (Bachelor of Architecture) requires completion of the fifth year of studies in either the Architectural Design, Architectural Management, or Architectural Technology options as shown below.

*History Electives may be chosen from the following: World History (HY 101, 102, 103)

History of World Art (AT 171, 172, 173) or Technology and Civilization (HY 204, 205, 206)

**MH 162 or ACF 215 Fund. of Gen. and Cost Accounting (5)

***EH 304 or SC 202 Applied Speech Communication (3) or SC 211 Fundamentals of Speech Communication (5).

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives.

Seminars will be chosen from the following list:

AR 435	Art and Architectural Seminar	3
AR 460	The Architect and Society	3
AR 476	Seminar in Contemporary Concepts	5
AR 477	Seminar in Historical Problems	5
AR 478	Seminar in Tech. Problems	3
AR 479	Seminar in Architecture Literature	2

ARCHITECTURAL PROFESSIONAL OPTIONS

Architectural Design Option

FIFTH YEAR

AR 465	Arch. Design	8	AR 466	Arch. Design	8	AR 467	Arch. Design	8
AR 472	Prof. Practice	3	AR 599	Design Research	2	AR	Seminar	5
	Elective	5		Elective	3		Elective	3
				Elective	3			

BACHELOR OF ARCHITECTURE

TOTAL-257 QUARTER HOURS

Architectural Management Option

FIFTH YEAR

AR 485	Arch. Manag.	5	AR 486	Arch. Manag.	5	AR 487	Arch. Manag.	8
AR 472	Prof. Practice	3	MN 242	Bus. Law II	4	AR	Seminar	5
MN 241	Bus. Law I	4	MN 442	Personal Manag.	5		Elective	3
	Elective	3		Elective	3			

BACHELOR OF ARCHITECTURE

TOTAL-257 QUARTER HOURS

Architectural Technology Option

FIFTH YEAR

AR 445	Arch. Technology	4	AR 446	Arch. Tech.	4	AR 447	Arch. Tech. Thesis	8
AR 472	Prof. Practice	3		Tech. Electives*	10		Tech. Electives*	4
	Tech. Electives*	9		Seminar**	3		Seminar	3

*Technical Electives must be selected from lists approved by the department.

**Legal aspects of Architecture Seminar or EGR 491 recommended.

Bachelor of Architecture

TOTAL—257 QUARTER HOURS

Interior Design

The curriculum in Interior Design seeks to prepare the student to take his place as a professional specialist in the design of interior space. As such, he expects to assume a responsible role among those who shape the physical environment. His primary interest in the development of the interiors lies with the social, historical and technical implications of the development of interior space, surface and material.

Curriculum in Interior Design

FIRST YEAR

First Quarter			Second Quarter			Third Quarter		
AR	110	Design Fund.....5	AR	111	Design Fund.....5	AR	112	Design Fund.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
AT	171	Hist. World Art.....3	AT	172	Hist. World Art.....3	AT	173	Hist. World Art.....3
MH	140	College Algebra.....5	MH	161	Ar. Geom. & Cal.....5	PG	212	Psychology.....3
PE		Physical Education.....1	PE		Physical Education.....1	PE		Physical Education.....1
								Elective.....3

SECOND YEAR

First Quarter			Second Quarter			Third Quarter		
AR	201	Arch. Design.....5	AR	202	Arch. Design.....5	AR	203	Arch. Design.....5
ID	215	Elements of I.D.....3	ID	216	Elements of I.D.....3	ID	217	Elements of I.D.....3
AR	261	Hist. & Theo. Arch.....3	AR	262	Hist. & Theo. Arch.....3	AR	263	Hist. & Theo. Arch.....3
		Nat. Sci. Elective.....5			Nat. Sci. Elective.....5	SY	201	Sociology.....5
					Elective.....3			

THIRD YEAR

ID	305	Interior Design.....5	ID	306	Interior Design.....5	ID	307	Interior Design.....5
ID	365	Period Int.....5	ID	366	Period Interiors.....5	ID	367	Contemp. Int.....5
ID	495	Spec. Probs.....5	MN	310	Prin. Manag.....5	EH	304	Tech. Writing.....3
		Elective.....3			Elective.....3			Elective.....3

FOURTH YEAR

ID	405	Interior Design.....5	ID	406	Interior Design.....5	ID	407	Int. Design (Thesis).....7
ID	441	Prof. Prac.....3	ID	408	Int. Design Res.....2			Elective.....5
ACF	340	Pers. Fin.....3			Creative Crafts,			Elective.....3
		Elective.....5			Textile Design, Weaving,			
					or Photography.....3			
					Elective.....3			
					Elective.....5			

BACHELOR OF INTERIOR DESIGN

TOTAL-206 QUARTER HOURS

*MH 161 or ACF 215 Fund. of Gen. and Cost Accounting (5)

**EH 304 or SC 202 Appl. Speech Comm. (3) or SC 211 Public Speaking (5).

AT 371, 372, or 373, Art History may be substituted for AT 171, 172 or 173.

Two months of practical experience with a professional interior designer is required between the third and fourth year.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours general electives.

Industrial Design

Industrial Design is concerned primarily with the practical and aesthetic relation of products and systems to those who use them. The Industrial Designer as a leading member of a research and development team—composed of engineers, scientists, and designers—is responsible for the product's shape, color, proportion, and texture, or for the optimum interaction between man and technology in a system. He is deeply concerned with such factors of use as efficiency, convenience, safety, comfort, maintenance, and cost.

The Industrial Designer's activity encompasses areas such as product design, transportation design, industrialized building, package design, exhibition design, and systems design.

The student of Industrial Design learns, for example, the basic principles of design, engineering, human factors designing, marketing, and sociology. He acquires such technical skills as drafting, model-making, photography and sketching techniques. He is introduced to design methods, product planning, visual statistics, materials, manufacturing methods, consumer psychology, and environmental studies.

The four-year curriculum leads to the professional degree of Bachelor of Industrial Design. The program is approved by the Industrial Designers Society of America. Graduates will qualify for positions in industrial design consultant offices and in various industries.

The Cooperative Education Program is also offered. For more information refer to page 27.

Curriculum in Industrial Design (IND)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH	140	College Algebra.....5	MH	161	An. Geom. & Cal.....5	BI	101	Prin. of Biology.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
HY	204	Tech. & Civilization.....3	HY	205	Tech. & Civilization.....3	HY	206	Tech. & Civilization.....3
TS	102	Graphic Comm. & Des.2	TS	104	Desr. Geometry.....2	TS	105	Engr. Drawing.....2
TS	111	Woodworking.....1	TS	112	Welding Science.....1	TS	114	Sheetmetal Design.....1
PE		Physical Education.....1	TS	113	Machine Tool Lab.....1	TS	115	Foundry Tech.....1
			PE		Physical Education.....1	PE		Physical Education.....1

SOPHOMORE YEAR

IND	210	Industrial Design.....6	IND	211	Industrial Design.....6	IND	212	Industrial Design.....6
IND	221	Materials & Tech.....5	IND	222	Tech. Illustration.....5	IND	223	Ind. Design Met.....5
		Elective.....5	EC	200	Economics I.....5	PS	204	Fnds. of Physics.....5
PG	212	Psychology.....3			Elective.....3	TS	204	Kinematics of Mach.....3

JUNIOR YEAR

IND	310	Industrial Design.....6	IND	311	Industrial Design.....6	IND	312	Industrial Design.....6
IND	307	Anthropometry.....5	IND	308	Design Workshop.....5	IND	309	Design Comm.....5
TS	308	Gauges & Meas.....5			Elective.....5	MT	331	Prin. of Mkt.....5
			AT	371, or 382, or 373	Art History.....3			Elective.....3

SENIOR YEAR

IND	410	Industrial Design.....6	IND	411	Industrial Design.....6	IND	412	Ind. Design Thesis.....6
PG	461	Industrial Psych.....5	IND	415	Hy. of Ind. Des.....5	IND	485	Seminar in Ind. Design.....5
PG	490	Human Factors.....3			Elective.....5	SY	408	Ind. Sociology.....5
		Elective.....3						

BACHELOR OF INDUSTRIAL DESIGN

TOTAL—207 QUARTER HOURS

Electives must come from the list of approved courses in the Sciences and the Humanities.

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives.

Students who hold a bachelor's degree are eligible to apply to the Dean of the Graduate School for admission to the graduate program leading to the Master of Industrial Design degree. For details see the *Graduate School Bulletin*.

Department Of Art

The Visual Arts curriculum trains students to become professional practitioners as artist-teachers, graphic designers, illustrators, advertising artists, art directors, painters, sculptors, printmakers, etc. It leads to the Bachelor of Fine Arts degree, and its program of studio courses is combined with studies of the function and historical background of the visual arts. Courses in general education promote in students a comprehension of their responsibilities to their society and culture. A sound program of fundamental courses in drawing, design, painting, and three-dimensional expression should presuppose advanced courses in which students work with a maximum of independence under the guidance of qualified instructors.

The Visual Arts curriculum may be divided into three general categories: academic courses, studio courses and courses in art history. Studio courses are divided into three progressive group levels. The first year is made up of visual art fundamentals. The second and third years contain classes in basic

traditional media in which the student learns technical procedures and develops the disciplines necessary to express himself fully in the third and fourth year areas of concentration. The third and fourth year areas include drawing, painting, printmaking, sculpture, visual design and illustration.

The areas of design, drawing, painting, printmaking, and sculpture enrich one another. Close association between the respective areas results in mutual benefits. The Visual Design program gives fundamental training in the techniques of graphic design and related areas of visual communication. It is strongly reinforced with courses in painting, drawing, printmaking, sculpture and art history, and studio electives, providing further opportunity for students to emphasize courses in creative studio work. Students preparing themselves as practicing artists or artist-teachers may concentrate entirely upon the offerings in painting, drawing, printmaking, sculpture and art history. Students planning to teach at the college level need to secure a Master of Fine Arts degree at this or another institution.

The department also offers courses for education majors specializing in art, and for students in other fields who seek general knowledge and appreciation of the visual arts. Students in the School of Arts and Sciences may elect a minor (15 hours), a double minor (30 hours), or B.A. with art major (See page 82).

The Art Department program meets the requirements of the Auburn University Liberal Education Program and the National Association of Schools of Art. The Department of Art is an accredited member of the National Association of Schools of Art, and a member of the College Art Association.

Transfer

All course work to be considered for transfer credit should be the equivalent of work required in the Visual Arts curriculum at Auburn. Art studio course credit earned (C or better) will be considered for advanced standing if a complete portfolio of work is submitted to the Auburn Art Department for evaluation. If the examples do not approximate Auburn's requirements, then credit may be given for an art studio elective. If the quality of work is not acceptable, credit may be given for an open elective.

Graduate Study in Fine Arts

Students who hold the degree of Bachelor of Fine Arts, or a similar degree, are eligible to apply to the Dean of the Graduate School for admission to the graduate program leading to the Master of Fine Arts degree. For details examine the *Graduate School Bulletin*.

Curriculum in Visual Arts (VA)

FIRST YEAR											
First Quarter				Second Quarter				Third Quarter			
AT 111	Fundamentals	5		AT 112	Fundamentals	5		AT 113	Fundamentals	5	
AT 121	Fundamentals	5		AT 122	Fundamentals	5		AT 123	Fundamentals	5	
AT 171	Hist. of World Art	3		AT 172	Hist. of World Art	3		AT 173	Hist. of World Art	3	
EH 101	English Comp.	3		EH 102	English Comp.	3		EH 103	English Comp.	3	
PE	Physical Education	1		PE	Physical Education	1		PE	Physical Education	1	
SECOND YEAR											
AT	Group A Studio	5		AT	Group A Studio	5		AT	Group A Studio	5	
AT	Group A Studio	5		AT	Group A Studio	5		AT	Group A Studio	5	
	Natural Science	5			Social Science	5			Natural Science	5	
	Math/Philosophy	3			Math/Philosophy	3			Elective	3	

THIRD YEAR		
First Quarter		
AT	Group A Studio.....5	
AT	Group A Studio.....5	
AT	Natural Science.....5	
AT 371	Greek and Roman Art.....3	
Second Quarter		
AT	Group A Studio.....5	
AT	Group A or B Stdo.....5	
AT	Nat. or Soc. Sci.....5	
AT 372	Renaissance Art.....3	
Third Quarter		
AT	Group B Studio.....5	
AT	Group A or B Stdo.....5	
AT	Nat. or Soc. Sci.....5	
AT 373	Modern Art.....3	
FOURTH YEAR		
AT	Group B Studio.....5	
AT	Group B Studio.....5	
AT	Elective.....5	
AT	Elective.....3	
AT 498	Honors Project or	
AT 499	Terminal Project.....5	
AT	Elective.....5	
AT	Elective.....5	

TOTAL—210 QUARTER HOURS**GROUP A STUDIO**

Prerequisites: AT 113, 123, 171, 172, and 173 (or by special permission).

Figure Drawing		Visual Communications		Painting	
AT 211	Basic Figure Drawing	AT 221	Graphic Processes	AT 231	Oil Painting
AT 212	Figure Construction	AT 222	Design Systems	AT 232	Transp. Wtr. Color
AT 313	Figure Drawing	AT 323	Layout	AT 333	Opaque Wtr. Color
Printmaking		Sculpture			
AT 241	Relief Printmaking	AT 251	Modeling/Construction		
AT 242	Intaglio Printmaking	AT 252	Wood/Stone Sculpture		
AT 343	Planographic Printmaking	AT 353	Metal Sculpture		

GROUP B STUDIO

Areas of concentration are followed by their prerequisites.

AT 314, 415-416	Advanced Drawing 1, 2, 3.....1.0	Average in Group A Drawing
AT 324, 425-426	Visual Communications 1, 2, 3.....1.0	Average in Group A Drawing and Visual Design
AT 334, 435-436	Advanced Painting 1, 2, 3.....1.0	Average in Group A Drawing and Painting
AT 344, 445-446	Advanced Printmaking 1, 2, 3.....1.0	Average in Group A Drawing and Printmaking
AT 354, 455-456	Advanced Sculpture 1, 2, 3.....1.0	Average in Group A Drawing and Sculpture
AT 364, 465-466	Illustration 1, 2, 3.....1.0	Average in Group A Drawing, Visual Design and Painting

Department Of Building Science

The purpose of the curriculum in Building Science (formerly Building Technology) is to develop professionally knowledgeable practitioners and managers for a wide variety of roles in the construction industry.

The Department of Building Science offers courses in the design of structural and mechanical systems for buildings, construction procedures, building cost estimation and construction management. The curriculum leads to the degree of Bachelor of Science in Building Construction.

Curriculum in Building Science (BSC)

FIRST YEAR		
First Quarter		
MH 160	Pre-Cal. w. Trig.....5	
BSC 101	Intr. to Building.....3	
EH 101	English Comp.....3	
HY 204	Tech. & Civil.....3	
PE	Physical Education.....1	
Second Quarter		
MH 161	An. Geom. & Cal.....5	
BSC 102	Drawing & Proj.....3	
EH 102	English Comp.....3	
HY 205	Tech. & Civil.....3	
PE	Physical Education.....1	
Third Quarter		
BSC 206	Matls. & Constr.....5	
MH 162	An. Geom. & Cal.....5	
EH 103	English Comp.....3	
HY 206	Tech. & Civil.....3	
PE	Physical Education.....1	
SECOND YEAR		
PS 205	Physics.....5	
ACF 211	Intr. Acct.....4	
BSC 261	Hist. of Bldg. I.....3	
	Elective.....6	
BSC 211	Mech. of Structures.....5	
ACF 212	Intr. Acct.....4	
BSC 262	Hist. of Bldg. II.....3	
	Computer Elective.....3	
	Elective.....3	

First Quarter			THIRD YEAR			Third Quarter		
BSC 311	Strength of Mats.	5	BSC 314	Reinforced Concrete	5	BSC 315	Arch. Structures	5
BSC 321	Constr. Prob. I	5	EC 445	Ind. Relations	5	BSC 322	Constr. Prob. II	5
EH 304	Tech. Writing	3	EGR 491	Leg. Asp. Engr.	5	BSC 324	Constr. Prob. IV	3
	Tech. Elective	5		Arch. & Design	3	BSC 340	Constr. Safety	3
				Tech. Elective	5		Elective	3
Second Quarter			FOURTH YEAR					
BSC 433	Constr. Methods & Estimating II	5	BSC 434	Constr. Methods & Estimating II	5	BSC 490	Terminal Project	8
BSC 323	Constr. Prob. III	3	BSC 453	Bldg. Equip. II	3		Tech. Elective	5
BSC 452	Bldg. Equip. I	3	BSC 480	Terminal Project	5			
	Tech. Elective	5		Research	2			
	Elective	3		Tech. Elective	5			
				Elective	4			

TOTAL—207 QUARTER HOURS

*HY 101, 102, 103, or EH 260, 261, 262 may be substituted for HY 204, 205, 206.

**CH 101, 102, 103L may be substituted for MH 162.

Technical Electives must be selected from lists approved by the Department.

Department Of Music

The Department of Music provides instruction and performing experience to students interested in developing their talents in music. The courses of study provided by the Department have been created to present a balance between creative skills and academic studies, allowing at the same time a certain flexibility to meet individual requirements.

The Department of Music offers to the Music major a professional curriculum leading to the degree Bachelor of Music, with majors in (a) Applied Music, (b) Theory and Composition, (c) Church Music, or (d) Piano Pedagogy. These programs provide preparation for the professional field of performance and for private or college teaching of applied music, theory, and composition. They also provide training for church organists and choir directors.

For the student wishing to major in Music History and Literature, the Department of Music offers a program of studies leading to the Bachelor of Arts in Music degree. This is a cultural, not a professional, degree.

Many general elective courses are available to all University students as well as courses in applied music in band and orchestral instruments, voice, piano, and organ. Performance groups such as the Marching and Concert Bands, Orchestra, University Singers, Concert Choir, Choral Union, and Opera Workshop are also available to students in all curricula.

Professional Curriculum in Music (MU)

(A) Applied Music Major

FIRST YEAR			Second Quarter			Third Quarter		
First Quarter								
MU 131	Mat. & Org. Music	5	MU 132	Mat. & Org. Music	5	MU 133	Mat. & Org. Music	5
EH 101	English Comp	3	EH 102	English Comp	3	EH 103	English Comp	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
MU 181	Applied Music (major)	3	MU 182	Applied (major)	3	MU 183	Applied (major)	3
MU 187	Applied Music (minor)	1	MU 188	Applied (minor)	1	MU 189	Applied (minor)	1
PE	Physical Education	1	MU	Perf. Group	1	MU	Perf. Group	1
MU 100	Convocation	0	PE	Physical Education	1	PE	Physical Education	1
MU	Perf. Group	1	MU 100	Convocation	0	MU 100	Convocation	0

SECOND YEAR

First Quarter			Second Quarter			Third Quarter		
MU	231	Mat. & Org. Music.....5	MU	232	Mat. & Org. Music.....5	MU	233	Mat. & Org. Music.....5
		Elective.....5			Natural Science.....5	MH	100	Mathematics.....5
MU	281	Applied Music.....3	MU	282	Applied (major).....3	MU	283	Applied (major).....3
		(major).....3	MU	288	Applied (minor).....1	MU	289	Applied (minor).....1
MU	287	Applied Music.....1	MU		Perf. Group.....1	MU		Perf. Group.....1
		(minor).....1	MU		Ensemble.....1	MU		Ensemble.....1
MU		Perf. Group.....1	MU	100	Convocation.....0	MU	100	Convocation.....0
MU		Ensemble.....1			Elective.....3			Elective.....3
MU	100	Convocation.....0						

THIRD YEAR

MU	331	Mat. & Org. Music.....5	MU	332	Mat. & Org. Music.....5	MU	333	Mat. & Org. Music.....5
PA	210	Philosophy.....3	PA	214	Philosophy.....3	MU	361	Conducting.....3
MU	351	Music History.....3	MU	352	Music History.....3	MU	353	Music History.....3
MU	381	Applied Music.....3	MU	382	Applied (major).....3	MU	383	Applied (major).....3
		(major).....3	MU		Ensemble.....1	MU	100	Convocation.....0
MU		Ensemble.....1	MU	100	Convocation.....0			Elective (Social or
MU	100	Convocation.....0			Elective (Social or			Nat. Sci.).....3
		Elective (Social or			Nat. Sci.).....3			
		Nat. Science).....3						

FOURTH YEAR

FL		Foreign Language.....5	FL		Foreign Language.....5	FL		Foreign Language.....5
MU	481	Applied Music.....3	MU	482	Applied (major).....3	MU	483	Applied (major).....3
		(major).....3	MU		Pedagogy.....1	MU		Ensemble.....1
MU	337	Modern Harmony.....3	MU		Ensemble.....1	MU	363	Conducting.....1
MU		Ensemble.....1	MU	362	Conducting.....1	MU	100	Convocation.....0
MU	100	Convocation.....0	MU	100	Convocation.....0			Elective.....3
		Elective (Social or			Elective.....3			
		Nat. Sci.).....6						

TOTAL—205 QUARTER HOURS

Six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

(B) Theory and Composition Major

FIRST YEAR

First Quarter			Second Quarter			Third Quarter		
MU	131	Mat. & Org. Music.....5	MU	132	Mat. & Org. Music.....5	MU	133	Mat. & Org. Music.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
HY	101	World History.....3	HY	102	World History.....3	HY	103	World History.....3
MU	184	Applied Music.....1	MU	185	Applied Music.....1	MU	186	Applied Music.....1
MU	116	Woodwind Instr.....1	MU	117	Woodwind Instr.....1	MU	118	Woodwind Instr.....1
MU	110	String Instr.....1	MU	111	String Instr.....1	MU	112	String Instr.....1
PE		Physical Education.....1	MU		Perf. Group.....1	MU		Perf. Group.....1
MU	100	Convocation.....0	PE		Physical Education.....1	PE		Physical Education.....1
			MU	100	Convocation.....0	MU	100	Convocation.....0
								Elective.....3

SECOND YEAR

MU	231	Mat. & Org. Music.....5	MU	232	Mat. & Org. Music.....5	MU	233	Mat. & Org. Music.....5
		Natural Science.....5			Natural Science.....5	MH	100	Mathematics.....5
MU	284	Applied Music.....1	PG	212	Psychology.....3	MU	286	Applied Music.....1
MU	113	Brass Instr.....1	MU	285	Applied Music.....1	MU	115	Brass Instr.....1
MU	107	Voice Class.....1	MU	114	Brass Instr.....1	MU	119	Brass Instr.....1
		Social Science Elect.....3	MU	108	Voice Class.....1	MU		Perf. Group.....1
MU		Perf. Group.....1	MU		Perf. Group.....1	MU		Ensemble.....1
MU		Ensemble.....1	MU		Ensemble.....1	MU	100	Convocation.....0
MU	100	Convocation.....0	MU	100	Convocation.....0			

THIRD YEAR

MU	331	Mat. & Org. Music.....5	MU	332	Mat. & Org. Music.....5	MU	333	Mat. & Org. Music.....5
MU	351	Music History.....3	MU	352	Music History.....3	MU	353	Music History.....3
MU		Modern Harmony I.....3	MU		Modern Harm. II.....3	MU		Modern Harm. III.....3
MU	437	Orchestration.....3	MU	438	Orchestration.....3	MU	386	Applied Music.....1
MU	384	Applied Music.....1	MU	385	Applied Music.....1	MU		Perf. Group.....1
MU		Perf. Group.....1	MU		Perf. Group.....1	MU		Ensemble.....1
MU	100	Convocation.....0	MU	100	Convocation.....0	MU	100	Convocation.....0
		Elective (Social or			Elective (Social or			Elective (Social or
		Nat. Science).....3			Nat. Science).....3			Nat. Science).....6

FOURTH YEAR

First Quarter		Second Quarter		Third Quarter	
FL	Foreign Language.....5	FL	Foreign Language.....5	FL	Foreign Language.....5
MU 434	Music Comp.....3	MU 435	Music Comp.....3	MU 436	Music Comp.....3
MU 439	Orchestration.....3	MU 485	Applied Music.....1	MU 486	Applied Music.....1
MU 484	Applied Music.....1	MU 445	Theory Pedagogy.....3	MU	Perf. Group.....1
MU	Perf. Group.....1	MU	Perf. Group.....1	MU 100	Convocation.....0
MU 100	Convocation.....0	MU 100	Convocation.....0		Elective.....3
	Elective.....6		Elective.....3		

TOTAL—206 QUARTER HOURS

Six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

(C) Church Music Major

FIRST YEAR

First Quarter		Second Quarter		Third Quarter	
MU 131	Mat. & Org. Music.....5	MU 132	Mat. & Org. Music.....5	MU 133	Mat. & Org. Music.....5
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
HY 101	World History.....3	HY 102	World History.....3	HY 103	World History.....3
MU 181	Applied Music.....3	MU 182	Applied (major).....3	MU 183	Applied (major).....3
	(major).....3	MU 188	Applied (minor).....1	MU 189	Applied (minor).....1
MU 187	Applied Music.....1	MU	Ensemble.....1	MU	Ensemble.....1
	(minor).....1	PE	Physical Education.....1	PE	Physical Education.....1
MU	Ensemble.....1	MU 100	Convocation.....0	MU 100	Convocation.....0
PE	Physical Education.....1				
MU 100	Convocation.....0				

SECOND YEAR

MU 231	Natural Science.....5	MU 232	Natural Science.....5	MH 100	Mathematics.....5
MU 281	Mat. & Org. Music.....5	MU 282	Mat. & Org. Music.....5	MU 233	Mat. & Org. Music.....5
	(major).....3	MU 288	Applied (minor).....1	MU 283	Applied (major).....3
MU 287	Applied Music.....1	MU	Ensemble.....1	MU 289	Applied (minor).....1
	(minor).....1	MU 100	Convocation.....0	MU	Ensemble.....1
MU	Ensemble (or MU 211).....1		Elective.....3	MU 100	Convocation.....0
MU 100	Convocation.....0				Elective.....3
	Elective.....3				

THIRD YEAR

MU 231	Mat. & Org. Music.....5	MU 332	Mat. & Org. Music.....5	MU 333	Mat. & Org. Music.....5
PA 210	Philosophy.....3	PA 214	Philosophy.....3	MU 353	Music History.....3
MU 351	Music History.....3	MU 352	Music History.....3	MU 383	Applied (major).....3
MU 381	Applied Music.....3	MU 382	Applied (major).....3	MU	Ensemble.....1
	(major).....3	MU 311	Liturgies.....3	MU 100	Convocation.....0
MU 312	Hymnology.....3	MU	Ensemble.....1		Elective.....6
MU	Ensemble.....1	MU 100	Convocation.....0		
MU 100	Convocation.....0				

FOURTH YEAR

FL	Foreign Language.....5	FL	Foreign Language.....5	FL	Foreign Language.....5
MU 361	Conducting.....3	MU 415	Organ Lit. or Vocal Pedagogy.....3	MU 416	Church Music Seminar.....3
MU 381	Applied Music.....3	MU 482	Applied (major).....3	MU 483	Applied (major).....3
	(major).....3	MU 362	Conducting.....1	MU 453	Choral Lit.....3
MU	Ensemble.....1	MU	Ensemble.....1	MU	Ensemble.....1
MU 100	Convocation.....0	MU 100	Convocation.....0	MU 100	Convocation.....0
	Elective (Social or Nat. Sci.).....6		Elective (Social or Nat. Sci.).....3		
			Elective.....2		

TOTAL—210 QUARTER HOURS

(D) Piano Pedagogy Major

FIRST YEAR

First Quarter		Second Quarter		Third Quarter	
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
HY 101	World History.....3	HY 102	World History.....3	HY 103	World History.....3
MU 131	Mat. & Org. Music.....5	MU 132	Mat. & Org. Music.....5	MU 133	Mat. & Org. Music.....5
MU 184	Applied Piano.....1	MU 185	Applied Piano.....1	MU 186	Applied Piano.....1
MU 100	Convocation.....0	MU 100	Convocation.....0	MU 100	Convocation.....0
PE	Physical Education.....1	PE	Physical Education.....1	PE	Physical Education.....1
MU 251	Surv. Music Lit.....1	MU 252	Surv. Music Lit.....1	MU 253	Surv. Music Lit.....1
MU 327	Piano Ensemble.....1	MU 327	Piano Ensemble.....1	MU 327	Piano Ensemble.....1
MU 187	Applied Minor.....1	MU 188	Applied Minor.....1	MU 189	Applied Minor.....1

SECOND YEAR

First Quarter	
MU 231	Mat. & Org. Music.....5
	Nat. Science.....5
MU 284	Applied Piano.....1
MU 287	Applied Minor.....1
MU 327	Piano Ensemble.....1
MU 100	Convocation.....0
	Elective.....3

Second Quarter	
MU 232	Mat. & Org. Music.....5
	Nat. Science.....5
MU 285	Applied Piano.....1
MU 288	Applied Minor.....1
MU 327	Piano Ensemble.....1
MU 100	Convocation.....0
	Elective.....3

Third Quarter	
MU 233	Mat. & Org. Music.....5
MH 100	Mathematics.....5
MU 286	Applied Piano.....1
MU 289	Applied Minor.....1
MU 327	Piano Ensemble.....1
MU 100	Convocation.....0
	Elective.....3

THIRD YEAR

MU 331	Mat. & Org. Music.....5
MU 351	Music History.....3
PA 210	Philosophy.....3
MU 384	Applied Piano.....1
MU 327	Piano Ensemble.....1
MU 457	Keyboard Lit.....1
	Soc. or Nat. Science.....3
MU 100	Convocation.....0

MU 332	Mat. & Org. Music.....5
MU 352	Music History.....3
PA 214	Philosophy.....3
MU 385	Applied Piano.....1
MU 327	Piano Ensemble.....1
MU 458	Keyboard Lit.....1
	Soc. or Nat. Science.....3
MU 100	Convocation.....0

MU 333	Mat. & Org. Music.....5
MU 353	Music History.....3
MU 361	Conducting.....3
MU 386	Applied Piano.....1
MU 327	Piano Ensemble.....1
MU 459	Keyboard Lit.....1
	Soc. or Nat. Science.....3
MU 100	Convocation.....0

FOURTH YEAR

FL	Foreign Language.....5
MU 447	Piano Pedagogy.....3
MU 327	Piano Ensemble.....1
MU 484	Applied Piano.....1
	Soc. or Nat. Science.....3
MU 337	Modern Harmony.....3
MU 100	Convocation.....0

FL	Foreign Language.....5
MU 448	Piano Pedagogy.....3
MU 327	Piano Ensemble.....1
MU 485	Applied Piano.....1
	Soc. or Nat. Science.....3
	Elective.....3
MU 100	Convocation.....0

FL	Foreign Language.....5
MU 449	Piano Pedagogy.....3
MU 327	Piano Ensemble.....1
MU 486	Applied Piano.....1
	Soc. or Nat. Science.....3
	Elective.....3
MU 100	Convocation.....0

TOTAL—195 HOURS

Bachelor of Arts

FIRST YEAR

First Quarter	
MU 131	Mat. & Org. Music.....5
EH 101	English Comp.....3
HY 101	World History.....3
MU 164	Applied Music.....1
	Ensemble.....1
MU	Physical Education.....1
PE	
MU 100	Convocation.....0

Second Quarter	
MU 132	Mat. & Org. Music.....5
EH 102	English Comp.....3
HY 102	World History.....3
PA 211	Philosophy.....3
MU 185	Applied Music.....1
MU	Ensemble.....1
PE	Physical Education.....1
MU 100	Convocation.....0

Third Quarter	
MU 133	Mat. & Org. Music.....5
MH 100	Mathematics.....5
EH 103	English Comp.....3
HY 103	World History.....3
MU 186	Applied Music.....1
MU	Ensemble.....1
MU 100	Convocation.....0

SECOND YEAR

MU 231	Mat. & Org. Music.....5
	Nat. Science.....5
EH 253	English Lit.....3
MU 284	Applied Music.....1
	Ensemble.....1
PE	Physical Education.....1
MU 100	Convocation.....0

MU 232	Mat. & Org. Music.....5
	Nat. Science.....5
EH 254	English Lit.....3
MU 285	Applied Music.....1
MU	Ensemble.....1
MU 100	Convocation.....0
	Elective.....3

MU 233	Mat. & Org. Music.....5
EH 255	English Lit.....3
MU 286	Applied Music.....1
	Ensemble.....1
AT 171	Art History.....3
MU 100	Convocation.....0
	Elective.....5

THIRD YEAR

MU 331	Mat. & Org. Music.....5
MU 351	Music History.....3
MU 384	Applied Music*.....1
PA 212	Philosophy.....3
MU 100	Convocation.....0
	Academic Minor.....5

MU 332	Mat. & Org. Music.....5
MU 352	Music History.....3
MU 385	Applied Music.....1
MU 100	Convocation.....0
	Academic Minor.....5
	Elective (Social or Nat. Science).....3

MU 333	Mat. & Org. Music.....5
MU 353	Music History.....3
MU 386	Applied Music.....1
MU 100	Convocation.....0
	Academic Minor.....5
	Elective (Social or Nat. Science).....3

FOURTH YEAR

PG 211	Psychology.....3
MU 484	Applied Music.....1
FL	Foreign Language.....5
MU 100	Convocation.....0
	Academic Minor.....5
	Elective (Social or Nat. Science).....3

FL	Foreign Language.....5
MU 361	Conducting.....3
MU 485	Applied Music.....1
MU 100	Convocation.....0
	Academic Minor.....5
	Elective (Social or Nat. Science).....3

FL	Foreign Language.....5
MU 486	Applied Music.....1
MU 100	Convocation.....0
	Academic Minor.....5
	Elective (Social or Nat. Science).....3

TOTAL—200 QUARTER HOURS

Six hours of Basic and six hours of Advanced ROTC may be scheduled in lieu of 12 hours of general electives.

*A minor of 30 quarter hours elected from approved courses.

Keyboard proficiency is required for non-keyboard majors. In such cases three of the applied music credits will be taken in piano.

Supplementary Requirements for Bachelor of Music and Bachelor of Arts Degree Candidates

1. Attendance at student convocations is compulsory. Absences may be excused only by the Head of the Music Department.
2. At the end of the Sophomore year a comprehensive examination will be given which must be passed before the student is admitted to the upper division music courses. Transfer students must complete this examination to receive junior standing.
3. A. Students electing the applied music major will present a junior recital during the third year of study and a senior recital during the fourth year of study.
B. Students electing the theory and composition major will present an original composition in small form during the third year of study and an original composition in large form during the fourth year of study.
C. Students electing the history and literature major will present a written thesis during the fourth year of study.
D. Students electing the church music major will present a senior recital during the fourth year of study.
E. Students electing the Piano Pedagogy major will present a senior recital during the fourth year of study.
4. Credit in applied music is based on the amount of practice, each credit hour requiring a minimum of five hours practice per week.
5. Students whose major performing medium is not piano or organ will elect piano as the minor instrument.
6. Participation in an approved music performing group is required each quarter, with or without credit.
7. All students taking applied music will meet public performance requirements as designated by the faculty. (See Music Department special regulations regarding requirements for jury examinations and convocation performances.)

Music Education

Teacher Education: Admission to the Teacher Education Program of the School of Education is open to students registered in the School of Architecture and Fine Arts to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements of both the Teacher Education Program and the professional curriculum in music, the Dean of the School of Education will recommend to the appropriate State Department of Education that a professional certificate be issued. It is considered desirable for students who wish to engage in junior high or high school teaching to identify this objective as soon as possible in their four-year undergraduate work. Such students will be advised by two advisers, a professional education adviser in the School of Education and an academic adviser in the Department of Music. The advisers will counsel in their respective areas. Flexibility in scheduling student course requirements is to be permitted in the pursuit of the requirements for both curriculum in music and Teacher Education training.

Music Organization

Several musical organizations, sponsored by the University and directed by the Department of Music, provide excellent training in group music. See section on musical groups in the student handbook, *Tiger Cub*. These activities, which are open to students of the University, may be taken with or without credit.

Graduate Work in Music

Admission to graduate work toward the Master of Music Degree requires a Bachelor's degree in music, music education, or the equivalent from this or another recognized institution. Admission to graduate study in the Music Department shall be in accordance with policies of the Graduate School. In addition, all candidates must take entrance examinations in music theory and history administered by members of a Departmental Screening Committee, demonstrate competency at the keyboard, and fulfill additional requirements as follows:

Instrumental Majors—Audition

Voice Majors—Audition and demonstration of satisfactory diction in Italian, French, and German.

(See graduate catalogue for details)

Students who hold a baccalaureate degree in Education with a Major in Music are eligible to apply to the Dean of the Graduate School for admission to the graduate courses leading to the degrees Master of Science and Master of Education with Major in Music.

Department Of Theatre

The Theatre curriculum offers courses leading to the degree Bachelor of Arts in Theatre. The purpose of the theatre curriculum at Auburn University is to develop creative and knowledgeable practitioners and teachers of the theatre art. The program is organized to provide a broad range of performance and classroom experiences so that the technical training and academic discipline gained thereby will prepare the student for creative work in the theatre wherever it may be undertaken, professionally or academically.

The program emphasizes theatre as a *discipline*, involving natural endowment, study, and exercise or practice. While natural endowment is not under the control of the faculty, it is recommended that only those students who show evidence of abilities in theatre art should pursue the major. Each student will be given ample opportunity to explore his personal resources. Course work, laboratories, and play productions provide the opportunity to develop sound foundations in the various elements of the theatre art—playwriting, directing, acting, and designing—on the basis of which to perfect natural abilities.

Thus, performance and classroom study are considered of equal and complementary value to the student's theatre training, for the produced play is the experience that most nearly unites all that is contained in "theatre art," and is the principal means to coordinate the theatrical elements. Since drama and theatre can best be comprehended and appreciated in combination rather

than in isolation from each other, formal study is combined with continuous application in the production program of the Auburn University Theatre.

The department also offers courses in children's theatre, creative dramatics, and fundamentals of recreational dramatics for elementary and secondary education majors, as well as courses in theatrical theory and practice for students seeking general knowledge and appreciation of theatre art. Students in the School of Arts and Sciences may elect a minor (15 hours) or a double minor (30 hours) in Theatre. Those wishing to minor should consult the department for specific recommendations. Students in the School of Education may elect a minor or major in Theatre (see page 117). Although the objectives of students may vary, those completing the degree programs should reach competence as either instructors or performers in their specific areas of emphasis in theatre.

Curriculum in Theatre (TH)

FIRST YEAR

First Quarter			Second Quarter			Third Quarter					
BI	101	Prin. of Biology.....	5	BI	104	Bio. of Human Affairs.....	5	PA	210	Intr. to Philosophy.....	3
EH	101	English Comp.....	3	EH	102	English Comp.....	3	EH	103	English Comp.....	3
HY	101	World History.....	3	HY	102	World History.....	3	HY	103	World History.....	3
TH	104	Intr. to Theatre I.....	3	TH	105	Intr. to Theatre II.....	3	TH	106	Intr. to Theatre III.....	3
TH	107	Stage Craft I.....	1	TH	108	Stage Craft II.....	1	TH	106	Elective (Social or Nat. Sci.).....	3
PE	101	Fund. of Phys. Ed.....	1	PE	108	Group I.....	1	TH	109	Stage Craft III.....	1
TH	100	Convocation.....	0	TH	100	Convocation.....	0	PE	109	Group II.....	1
								TH	100	Convocation.....	0

SECOND YEAR

TH	204	Acting Fund. I.....	5	TH	205	Acting Fund. II.....	5	TH	206	Acting Fund. III.....	5
TH	201	Contemp. Amer. Theatre.....	3	TH	207	Stage Make-up.....	3	EH	225	English Lit.....	3
PA	216	Philosophies of Man.....	3	PG	212	Psychology.....	3	AT	173	Art History.....	3
EH	253	English Lit.....	3	EH	254	English Lit.....	3	TH	309	Costume.....	3
AT	171	Art History.....	3	AT	172	Art History.....	3	MU	201, 373, or 374.....	3	
TH	199	Theatre Lab.....	2	TH	199	Theatre Lab.....	2	TH	199	Theatre Lab.....	2
TH	100	Convocation.....	0	TH	100	Convocation.....	0	TH	100	Convocation.....	0

THIRD YEAR

TH	304	Stage Design Fund.....	5	EH	361	Hist. of Eng. Drama.....	5				
		Elective (Social or Nat. Sci.).....	5	TH	302	Theatre in West.....	3	TH	306	Theatre Design II.....	3
TH	301	Theatre in West.....	3	TH	305	Theatre Design I.....	3	TH	323	Costume Patterning.....	3
		Civilization.....	3	TH	322	Costume Design.....	3	TH	303	Theatre in West.....	3
TH	321	Costume History or	3	TH	111	Theatre Practice.....	1	TH	111	Theatre Practice.....	1
TH	326	Stage Lighting.....	3	TH	100	Convocation.....	0	TH	100	Convocation.....	0
TH	111	Theatre Practice.....	1								
TH	100	Convocation.....	0								

FOURTH YEAR

EH	451	Shakespeare.....	5	TH	452	Theatre Elective.....	6	EH	353	Contemporary Drama or	5
TH	401	Theatre Elective.....	5	TH	405	Shakespeare.....	5	EH	492	American Drama.....	5
TH	401	Play Analysis.....	3	TH	405	Directing Fund. II.....	3	TH	406	Theatre Elective.....	5
TH	404	Directing Fund. I.....	3	TH	111	Theatre Practice.....	1	TH	406	Directing Fund. III.....	3
TH	111	Theatre Practice.....	1	TH	100	Convocation.....	0	TH	414	Mod. Theatre Backgrounds.....	3
TH	100	Convocation.....	0					TH	111	Theatre Practice.....	1
								TH	100	Convocation.....	0

TOTAL—206 QUARTER HOURS

Six hours of Basic ROTC and six hours of Advanced ROTC may be substituted for 12 hours of general electives.

School of Arts and Sciences

EDWARD H. HOBBS, *Dean*

LESLIE C. CAMPBELL, *Associate Dean*

GERALD W. JOHNSON, *Assistant Dean*

THE SCHOOL OF ARTS AND SCIENCES is the oldest and largest school in Auburn University. Three academic areas—humanities, physical sciences, and social sciences—are represented by the School's 14 departments—Chemistry, English, Foreign Languages, Geology, History, Journalism, Mathematics, Philosophy, Physics, Political Science, Psychology, Religion, Sociology and Anthropology, and Speech Communication.

In the School of Arts and Sciences a student can gain a broad general education and also acquire depth in the particular field in which he majors. This combination equips him with a strong foundation for post-baccalaureate specialization in graduate studies or professional schools. A further function of this school is to provide courses which are needed by students of all other instructional divisions of the University.

Undergraduate Degrees

Four-year bachelor's degree programs are offered in three areas:

1. The *General Curriculum* offers options in 20 major fields, with a wide choice of minors available both within the School of Arts and Sciences and in other schools of the University.

2. *Pre-professional Programs* are offered in pre-law, pre-dentistry, pre-medicine, pre-optometry, pre-hospital and health services administration, pre-occupational therapy, pre-physical therapy, pre-pharmacy, and pre-veterinary medicine.

3. *Special Curricula* are available in chemistry, chemistry with biochemistry option, criminal justice, geology, laboratory and medical technology, mathematics, applied mathematics, physics, applied physics, and public administration.

Embodied in these curricula are the requirements of the University-wide Liberal Education Program.

Graduate Degrees

Master of Arts degrees are offered in English, French, Spanish, history, political science, sociology, and speech communication. Master of Science degrees are offered in chemistry, mathematics, physics, and psychology.

Two special degrees, Master of French Studies and Master of Hispanic Studies, are offered by the Department of Foreign Languages. The School of Arts and Sciences participates in the offering of an interdisciplinary degree, Master of Arts in College Teaching.

Doctor of Philosophy degrees are offered in chemistry, English, history, mathematics, physics, and psychology. Degree programs are described in the *Graduate School Bulletin*.

Teacher Education

Through the Dual Objectives Program a student in the School of Arts and Sciences may prepare for a career as a secondary school teacher with a major in art, biology, chemistry, economics, English, foreign language, geography, history, mathematics, physics, political science, speech communication, or sociology.

Admission to the Teacher Education Program is open to students registered in the School of Arts and Sciences to the same extent that it is open to students registered in the School of Education. Upon completion of all requirements of both the Teacher Education Program and the General Curriculum, the Dean of the School of Education will recommend to the appropriate State Department of Education that a professional certificate be issued.

Students who wish to engage in junior high or senior high school teaching are encouraged to identify this objective as soon as possible in their four-year undergraduate work. They will be counseled by a professional education adviser in the School of Education and an academic adviser in the School of Arts and Sciences.

Cooperative Education Programs

Cooperative Education Programs which give students an opportunity to integrate their academic training with work experience are offered in art, biology, chemistry, criminal justice, journalism, mathematics, applied mathematics, physics, applied physics, political science, pre-law, psychology, sociology, and speech communication. Students alternate each quarter between school and a work assignment provided through the Director of the Cooperative Education Program.

Advisory Services for Students

The head of the department (or his designee) in which the student majors becomes the student's adviser and is charged with outlining the student's major and minor work. The Office of the Dean, however, provides counseling services to the student before he declares a major. For pre-professional students, counseling on professional school admission tests, admissions requirements and other such matters is provided as follows:

Chairman, Premedical-Predental Advisory Committee	Pre-Dentistry, Pre-Medicine, Pre-Optometry, Pre-Occupational Therapy, Pre-Physical Therapy
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Pre-Hospital and Health Services Administration Adviser	Pre-Hospital Administration
Pre-Law Adviser	Pre-Law

Pre-Veterinary Medicine Adviser	Pre-Veterinary Medicine
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Advisory services for Special Curricula and for the Teacher Education Program are provided by the appropriate departments.

The General Curriculum (GC)

The General Curriculum is designed to broaden the student intellectually through the humanities and the natural and social sciences. Twenty majors are available under this curriculum. (See pages 81-85.)

FRESHMAN YEAR														
First Quarter					Second Quarter					Third Quarter				
FL					FL					FL				

*A foreign language through the first year sequence as a minimum. (See page 266.)

**EH 253-254-255 or EH 260-261-262.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student is to complete his major requirements of at least 35 hours, two minors of at least 15 hours each (or a double minor of at least 30 hours), and elective work to total 201 hours. All major and minor courses are to be numbered 200 or above.

TOTAL—201 QUARTER HOURS

GROUP REQUISITE I. The student should take a minimum of ten hours in mathematics, or ten hours in philosophy, or ten hours in mathematics and philosophy, choosing the mathematics course or courses from MH 100, 140, 160, 161, 162, 163, and choosing the philosophy course or courses from PA 202, 210, 211, 212, 214, 216. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in either two or three quarters, depending upon the combination of courses chosen.

GROUP REQUISITE II. This three-course group allows the student to take courses which are prerequisites to his major; or take FED courses which are required in the Dual Objectives program; or take 200-300-level courses to satisfy requirements in a declared major, tentative major, or minor.

GROUP REQUISITE III. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104, CH 101-102-104, 103-104, GL 101-102, 101-103, 102-103, 110-103, PS 205-206, or PS 220-221-222.

GROUP REQUISITE IV. A course (3-5 hours) in art, economics (preferably 206), journalism (preferably 220), music, psychology, religion, speech communication, or theatre.

Majors and Minors in the General Curriculum

A student undecided about a major may delay declaring one until the end of his fifth quarter. Before a major is declared, his curriculum will be identified by the symbol GC (General Curriculum). As soon as he is reasonably certain, however, he should declare his major and identify it by the appropriate departmental symbol. (See page 86.) Students should consult with their advisers regularly to plan their major work, clear prerequisites, and take their major courses according to departmental schedule. A minimum of 35 hours is required in each major. All courses must normally be numbered 200 or above.

BACHELOR OF ARTS: Art, Comparative Literature, English, Foreign Language, Geology, History, Journalism, Philosophy, Political Science, Psychology, Social Work, Sociology, Speech Communication, and Theatre.

BACHELOR OF SCIENCE: Biology, Chemistry, Economics, Geography, Mathematics, and Physics.

Since some of the above majors require alignment of courses beginning in the freshman and sophomore years, it is important that the student be alert early in his college career to all of the requirements of his major.

MINORS: Students will select two minors (minimum of 15 hours credit in each) or one double minor (minimum of 30 hours credit) from the following: anthropology, architecture, art, botany, chemistry, criminal justice, economics, English, foreign language, geography, geology, history, journalism, mathematics, music, philosophy, physical education, physics, political science, psychology, religion, sociology, speech communication, theatre, zoology, and additional approved subjects in the Schools of Agriculture, Business, Education, Engineering, or Home Economics. Minor courses must normally be numbered 200 or above. Selected courses at the 100-level are, however, included in art, music, and theatre; for requirements in these fields, the student should see his adviser. A student cannot major and minor in the same field (except in foreign language; see page 83).

THE ACCOUNTING MAJOR. The Arts and Sciences student in the Pre-Law curriculum who selects a major in accounting will take a total of 43 quarter hours in accounting, including ACF 211, 212, 310, 311, 314, and 416.

THE ART MAJOR. The Arts and Sciences student selecting an art major will take AT 111-112-113 and 121-122-123 among his requisites and electives. The major will include AT 231, 232 or 333; AT 241, 242 or 343; AT 251, 252 or 353; and AT 371-372-373, plus 15 additional hours in art courses at the 200-level or above as approved by his adviser. (See also curricula in Visual Arts in the School of Architecture and Fine Arts.)

THE BIOLOGY MAJOR. The Arts and Sciences student selecting a major in biology will take BI 101-102-103; CH 103-104, including labs; and MH 160-161 among his requisites; and CH 207-208, including labs; PS 205-206 among his requisites or on his minors. The major will include BY 300, 306, ZY 300, 301, 303, 306, 310; plus two courses to be chosen from BY 505, 506, 515, 516, and two courses to be chosen from ZY 501, 511, 521, and 524. (See also Special Curricula in Biological Sciences in the School of Agriculture.)

THE CHEMISTRY MAJOR. A chemistry major in the General Curriculum will take CH 103-104-105 and labs (or 111-112-113), MH 160-161-162 among his requisites; and PS 205-206 (or 220-221-222) among his requisites or on a minor. The major will include CH 204-205, 207-208-209 and labs, plus 10 additional hours of chemistry on the 300-400-500-level. (See also Special Curriculum in Chemistry.)

THE COMPARATIVE LITERATURE MAJOR. Students selecting a major in comparative literature will take (a) EH 260-261-262; (b) 25 hours from among the following courses in comparative literature or literature in translation: EH 312, 340, 353, 571, 573, 574, and 575, FL 371, 372, and 373; (c) 10 hours of English literature numbered 300-level or above, or in the literature of a second foreign language if the student can demonstrate proficiency in that language; (d) a double minor in one foreign language including five 3-hour courses at the 300 and 400-level. In special cases the Comparative Literature Committee may accept a minor in another field in place of the foreign language minor. (See also the English/Comparative Literature option in the School of Education, Department of Secondary Education.)

THE ECONOMICS MAJOR. The Arts and Sciences student selecting a major in economics should take EC 200 and 202 during his sophomore year and, in

addition, a minimum of 35 hours of economics including EC 451, 454, and 456. EC 206 cannot count toward the major. (See also Curriculum in Economics in the School of Business.)

THE ENGLISH MAJOR. The major will take EH 253-254-255 (or, if qualified, EH 250-251), 20 hours of one foreign language, and five hours of English or European history. In addition, the English major must complete at least seven of the courses in Categories II-VII listed on pages 257-260. (The student may take courses in Category VIII as general electives but not for major credit.) The student's choice of these seven courses will be made in agreement with his English faculty adviser, who will be assigned to him upon his declaration of major and who will help him plan a comprehensive program of study. While there is no rigid prescription, such a program should normally include (1) at least two 300-level courses before any 400- or 500-level work is attempted, and (2) at least two courses from Category II and at least two courses from Category III.

THE FOREIGN LANGUAGE MAJOR. A major will consist of 35 hours in one language at a level higher than the initial three quarters (15 hours) offered by the Department of Foreign Languages. A minor will consist of 15 hours in one language at a level higher than the initial three quarters (15 hours). A student may major in one foreign language and minor in one other. Ordinarily no more than 80 hours of foreign languages may be used toward a bachelor's degree. However, students majoring in one language and minoring in another may count toward their bachelor's degree (beyond the 80 hours) the number of hours they have received in foreign languages through advanced placement to a maximum of 15. For advanced placement, see page 36.

THE GEOGRAPHY MAJOR. A major in geography will take EC 206, GY 214, 215, and MH 160-161 during the freshman and sophomore years. EH 260-261-262 and HY 204-205-206 are recommended. During the junior and senior years a major will take EH 304, either SY 220, IE 220, or EC 274, and an additional 30 hours of geography to include GY 300, 302, 305, 440, 500, 504, plus 10 other hours of 300-400-500-level geography courses. Minor fields of study will be chosen with the counsel and consent of the departmental adviser.

THE GEOLOGY MAJOR. A major in geology will take (1) a minimum of 35 hours in geology courses numbered at the 200-level or above, (2) mathematics through MH 163, and (3) a minimum of one year each in two of the following: (a) biological sciences, (b) chemistry, or (c) physics (students selecting the sequence PS 220-221-222 should also take MH 264). Minor sequences should be chosen with the advice and consent of the departmental adviser so as to strengthen the student's major field and/or area of intended specialization in employment after graduation. (See also Special Curriculum in Geology.)

THE HISTORY MAJOR. Prerequisites are HY 101-102-103. In addition, the major must include HY 201-202 and at least 25 hours of history courses numbered at the 300-level or above. The student should consult the History Department each quarter of his junior and senior years regarding completion of his major and minor fields.

THE JOURNALISM MAJOR. Forty-one hours of course work in journalism are required. Majors must take JM 221, 223, 224, 321, 322, 323, 421, 465, 485, and 422-423 or 425. Students majoring or minoring in journalism should consult the journalism faculty about their programs of study. JM 221 should be scheduled during the sophomore year.

THE MATHEMATICS MAJOR. A mathematics major in the General Curriculum should take MH 160 or 161, as appropriate, during his first quarter and complete the freshman calculus sequence MH 161-162-163 as early in his program as possible. He then will meet his major requirements by following one of two plans. **Plan I** is oriented toward theoretical mathematics and under it a student must take the courses MH 264, 265, 266, 331-332, 520-521, plus two additional approved upper-division mathematics courses. This plan may be used to prepare for graduate study in mathematics. Under **Plan II** a student must take MH 264, 265, 266, 331, 518, 520, 560, 567, plus one additional approved upper-division course. This program provides appropriate preparation in mathematics for a computer-related career. A suitable minor may be based on courses taught in the School of Engineering. A mathematics minor may not include courses numbered in the 280's or 580's. (See also Special Curricula in Mathematics.)

THE PHILOSOPHY MAJOR. Normally a major will take PA 210, 211, and 214 during his freshman or sophomore year. With approval PA 370 may be substituted for PA 211, and PA 202 for PA 214. In addition the major will include 35 hours of philosophy of which 15 hours must be taken in the history sequence PA 333-334-335. With approval PA 470 or 475 may be substituted for PA 333; PA 482, 484, or 590 for PA 334; and 380, 402, 432, 513, 580, or 591 for PA 335. The remaining 20 hours of work, tailored with departmental approval to individual interests, must be taken in courses at or above the 300-level. At least 15 of the 35 hours should be taken at the 400-500-level.

THE PHYSICS MAJOR. A physics major in the General Curriculum will take mathematics through MH 163 in his freshman and sophomore years, and MH 264 among his electives or on a minor. IE 204 is to be taken in the sophomore year. While not required, MH 265 is recommended during his junior year. Ten hours in another natural science (with laboratory) must be completed. The major will include PS 205-206, and 210 (or PS 220-221-222, and 320), PS 215, 300, 301 or 302, 303 or 304, and 305. Students electing a minor in physics will take PS 205, 206, and 210, (or PS 220, 221, 222, and 320). (See also Special Curricula in Physics and Applied Physics.)

THE POLITICAL SCIENCE MAJOR. The major consists of 35 hours of political science beyond PO 210; a minimum of one mathematics course selected from MH 140, 160 or 161; a minimum of one course from PO 300, 301, 302, 521, 590; at least 10 hours of credit at the 400-500-level other than PO 450 and 451.

THE PSYCHOLOGY MAJOR. A major will take at least 41 hours of psychology which will include PG 211-212, 215, at least three courses of experimental psychology, and four psychology courses at the 400-500-level.

THE SOCIAL WORK MAJOR. This major is designed to prepare students for (1) immediate employment in those social welfare positions which do not require a professional social work education at the graduate level, and (2) admission to graduate professional schools in social work. Admission to this major requires written approval of the Department of Sociology and Anthropology. The major requires beyond SY 201: (1) the following courses in the major: SW 252, 375 and 380 followed by SW 506, 507, 575, SY 220, 370, and SW 420; and (2) a double minor of 30 hours comprising approved courses in family and child development or psychology; or a minor in sociology and anthropology plus one outside minor.

THE SOCIOLOGY MAJOR. A major will consist of a minimum of 40 hours of courses in sociology following SY 201. These courses must include ANT 203, SY 220, SY 309 or SY 502, and SY 370 or RSY 370. In the selection of the remaining sociology courses to complete the major, the student is encouraged to consult with faculty advisers in the department so as to take those courses most helpful for the attainment of the student's particular objectives. One ANT (anthropology) course may be substituted, with department approval, for the sociology course requirements beyond the designated required courses. Sociology majors may minor in anthropology or social work.

THE SPEECH COMMUNICATION MAJOR. A major will consist of a minimum of 43 hours, which will include: (1) two of the following—SC 200, 201, 350; (2) one of the following—SC 202, 211, 220, 273; (3) 30 additional hours. An adviser will help students select the courses best suited to their needs.

THE THEATRE MAJOR. The Arts and Sciences student selecting a theatre major will take TH 104-105-106 and TH 107-108-109 among his requisites and electives. The major will include TH 201, 207, and 309; TH 301-302-303; TH 204, 304, 401, 404, plus 15 additional hours in theatre on the 300-400-level. Minor fields of study should be chosen with the counsel and consent of the departmental adviser. (See also the curriculum in Theatre in the School of Architecture and Fine Arts.)

East-European and Russian Studies Program

A student enrolled in the General Curriculum and majoring in history (GHY), philosophy (GPA) or political science (GPO) may elect the East-European and Russian Studies Program. Upon completion of this program and earning a bachelor's degree, the achievement will be noted in the student's transcript.

The student will be advised in the program by the Chairman of the Committee on East-European/Russian and Asian Studies as well as by the departmental adviser. The Committee Chairman should be consulted regarding the requirements and should be notified by the student of his intentions of entering the program.

Dual Degree Program in Engineering and Arts and Sciences

This program provides for enrollment in the General Curriculum of the School of Arts and Sciences for approximately three academic years and in the School of Engineering for approximately two academic years.

The student must complete the basic requirements of the General Curriculum and the requirements for a major therein. The student is not required to complete the minors or take the usual number of hours of electives. Thus he may transfer to the School of Engineering after the end of his Junior Year. Following completion of the academic requirements for one of the eleven baccalaureate degrees in the School of Engineering, he will be awarded two degrees: a degree in his Arts and Sciences major, either a bachelor of science or bachelor of arts depending upon major chosen, and a bachelor's degree in the designated Engineering field.

Group Requisites I, II, III, and IV in the General Curriculum will be fulfilled by taking the mathematics, natural science, economics, and psychology

courses which are required in the particular Engineering degree program for which the student is preparing.

A minimum of 151 credit hours must be completed in the Arts and Sciences General Curriculum. To become a dual-degree candidate under this program the student must have a grade point average and specified tests results which indicate the likelihood of satisfactory completion of Engineering School degree requirements, and a recommendation from the Dean of the School of Arts and Sciences. Recommendation should be sought one quarter before time of expected transfer to the School of Engineering.

It is also possible for very highly qualified students to transfer to the School of Engineering following the Junior Year with the intent of seeking a master's degree rather than a bachelor's degree in one of the engineering disciplines. Consult the office of the Dean of the School of Engineering concerning this option.

Symbols for Majors

The first letter in each symbol identifies the curriculum; the last two letters indicate the major.

Majors	General Curriculum	Pre-Law	Pre-Dentistry	Pre-Medicine	Pre-Optometry	Pre-Hosp. Adm.	Pre-Vet. Med.
Undeclared	GC	PL	PD	PM	OP	HA	PV
Accounting		LAC					
Art	GAT						
Biology	GBI	LBI	DBI	MBI	OBI	HBI	
Chemistry	GCH	LCH	DCH	MCH	OCH	HCH	
Comparative Lit.	GCL	LCL	DCL	MCL	OCL	HCL	
Economics	GEC	LEC	DEC	MEC	OEC	HEC	VEC
English	GEH	LEH	DEH	MEH	OEH	HEH	VEH
Foreign Lang.	GFL	LFL	DFL	MFL	OFL	HFL	VFL
Geography	GGY	LGY	DGY	MGY	OGY	HGY	VGY
Geology	GGL	LGL	DGL	MGL	OGL	HGL	
History	GHY	LHY	DHY	MHY	OHY	HHY	VHY
Journalism	GJM	LJM	DJM	MJM	OJM	HJM	VJM
Mathematics	GMH	LMH	DMH	MMH	OMH	HMH	VMH
Philosophy	GPA	LPA	DPA	MPA	OPA	HPA	VPA
Physics	GPS	LPS	DPS	MPS	OPS	HPS	
Political Science	GPO	LPO	DPO	MPO	OPO	HPO	VPO
Psychology	GPB	LPB	DPB	MPB	OPB	HPB	VPB
Social Work	GSW						
Sociology	GSY	LSY	DSY	MSY	OSY	HSY	VSY
Speech Comm.	GSC	LSC	DSC	MSC	OSC	HSC	VSC
Theatre	GTH						

Pre-Professional Curricula

Pre-professional programs are offered in pre-law, pre-dentistry, pre-medicine, pre-optometry, pre-hospital and health services administration, pre-occupational therapy, pre-physical therapy, pre-pharmacy, and pre-veterinary medicine.

Curriculum in Pre-Law (PL)

The pre-law curriculum is designed to prepare students for accredited professional law schools, most of which require for admission a bachelor's degree, a good scholastic record, and a good score on the national Law School Admission Test. The pre-law student should take the LSAT at least nine months ahead of the date he expects to enter law school.

A pre-law student who gains admission into an accredited law school short of a degree may obtain a combination bachelor's degree by completing the first three years of this curriculum (including the special requirements listed below) and the freshman year of law school.

FRESHMAN AND SOPHOMORE YEARS

The student will follow the General Curriculum and will take EC 200 as one course in Group Requisite II.

JUNIOR AND SENIOR YEARS

During the junior and senior years, the pre-law student should complete his major requirements of at least 35 hours, two minors of at least 15 hours each, or a double minor of at least 30 hours, and additional work to total 201 hours. He should take EC 202, PG 211, ACF 215, EH 390, HY 306, 571, PO 501 or 502, and SC 202 or 211 in his major, minor, requisites, or electives. Recommended in addition to these are SC 278 and an additional course in political science, or PG 535.

TOTAL—201 QUARTER HOURS

Major in the Pre-Law Curriculum

The *Pre-Law Adviser* will guide the student concerning law school admission requirements, and the department in which the student majors will advise him in his major work. Majors are:

BACHELOR OF ARTS: English, Comparative Literature, Foreign Language, Geology, History, Journalism, Philosophy, Political Science, Psychology, Sociology, and Speech Communication.

BACHELOR OF SCIENCE: Accounting, Biology, Chemistry, Economics, Geography, Mathematics, and Physics.

A student, upon selection of a major, should check requirements and utilize Group Requisites I, II, III, and IV as much as possible to clear lower level requisites during his freshman and sophomore years. (See Symbols for Majors on page 00.)

Curriculum in Pre-Dentistry (PD), Pre-Medicine (PM), and Pre-Optometry (OP)

This curriculum leads to a Bachelor of Science degree and is designed to prepare students for medical, dental, and optometry schools. The requirements are very exacting and demand high scholastic competence and performance. Students must strive for a B-plus four-year college record to attain good promise of being selected by a professional school.

Completion of this curriculum does not guarantee admission to a professional school of dentistry, medicine, or optometry. Competition for admission to the professional schools is keen with the number of qualified applicants exceeding the number of places available.

The bachelor's degree is required by most dental and medical schools for admission; however, should an outstanding student gain admission to a dental or medical school prior to graduation, he may receive a combination B.S.

degree by completing successfully the first nine quarters of this curriculum, including the special requirements listed as (a) under the Junior and Senior years below, a total of 157 quarter hours, and the freshman year of professional school.

Students with outstanding records who are able to gain admission to an accredited school of optometry before graduation may qualify for the combination B.S. degree by one of the following methods: (1) completing successfully the first nine quarters of this curriculum including the special requirements listed as (a) under Junior and Senior years below, a total of 157 quarter hours, plus the freshman year of professional optometry school; or (2) completing successfully the first two years of this curriculum, a total of 111 quarter hours, plus three years of professional optometry school.

The *Premedical-Pre dental Advisory Committee* will guide the student concerning professional school admission requirements, but the department in which the student majors will guide him in his major work. A student in pre-dentistry or pre-medicine should take the national Dental Aptitude Test or the Medical College Admission Test at least a year in advance of the date he plans to enter professional school, and follow with an application to the professional school of his choice. The student should seek information from the Premedical-Pre dental Advisory Committee concerning procedures he must follow to obtain the necessary committee evaluation and recommendation to the professional school to which he seeks admission early in his junior year. Forms and instructions are available in the office of the Dean of Arts and Sciences.

The Pre-Optometry student should write for an official bulletin from each of the professional schools of his choice during his freshman year, and discuss with the *Pre-Optometry Adviser* any special requirements of those particular schools. He should take the Optometry College Admission Test and make official application for admission to the professional schools about a year in advance of the expected date of matriculation.

FRESHMAN YEAR											
First Quarter				Second Quarter				Third Quarter			
CH 111	General Chemistry.....	5		CH 112	General Chemistry.....	5		CH 113	General Chemistry.....	5	
MH 161	An. Geom. & Cal.....	5		MH 162	An. Geom. & Cal.....	5		MH 163	An. Geom. & Cal.....	5	
EH 101	English Comp.....	3		EH 102	English Comp.....	3		EH 103	English Comp.....	3	
HY 101	World History.....	3		HY 102	World History.....	3		HY 103	World History.....	3	
	ROTC or Elective.....	1			ROTC or Elective.....	1			ROTC or Elective.....	1	
PE	Physical Education.....	1		PE	Physical Education.....	1		PE	Physical Education.....	1	
SOPHOMORE YEAR											
BI 101	Prin. Biol. & Lab.....	5		BI 102	Plant Biol. & Lab.....	5		BI 103	Animal Biol. & Lab.....	5	
CH 207	Organic Chem. & Lab.....	5		CH 208	Organic Chem. & Lab.....	5		CH 209	Organic Chemistry.....	5	
PS 205	Intr. Physics.....	5		PS 206	Intr. Physics.....	5		PS 210	Modern Physics.....	5	
EH	Literature*.....	3		EH	Literature*.....	3		EH	Literature*.....	3	
	ROTC or Elective.....	1			ROTC or Elective.....	1			ROTC or Elective.....	1	

*EH 253-254-255 or EH 260-261-262

The student must declare a major by the end of his sixth quarter.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student will complete the following special requirements: (a) CH 204 and Lab*, CH 316 or 507-508, EH 390, PG 211, 212, PO 209, SY 201, an additional PO or SY course, ZY 300, 302, one 200-level philosophy course, preferably PA 218, and (b) the requirements of his major which is to be selected from those listed under Symbols for Majors on page 86. Other recommended courses are ANT 203, ANT 207, AT 122, BY 300, EC 200, 202, FL through the first two quarters of the first year sequence as a minimum (see page 266), GL 101, 102, HY 306, IE 204, MH 264, 265, PG 330, SC 211, SY 202, ZY 301, 310, 520, 524, and/or 300-400-500-level courses in English, history, philosophy, political science, and sociology.

*CH 204 and lab are requisite when the professional school to which the student applies requires them.

TOTAL—209 QUARTER HOURS

A student should become acquainted with the requirements for his major (see page 81) to begin as early as possible the alignment of courses required.

Curriculum in Pre-Hospital and Health Services Administration (HA)

This curriculum, leading to a Bachelor of Science degree, is designed to prepare students for admission to graduate schools of health services administration which include such fields as hospital administration, health planning, rehabilitation, nursing homes, governmental health services, mental retardation, mental health, and health association work. Opportunities for graduate training are available in some of these areas through the Ph.D. level, especially for students interested in careers in research and teaching.

The student should strive for a college record of B or higher to attain reasonable promise of being admitted to a graduate program in the professional school of his choice. Completion of this curriculum does not guarantee admission to a professional school of hospital administration. Competition for admission to the professional schools is keen with the number of qualified applicants exceeding the number of places available.

The *Pre-Hospital and Health Services Administration Adviser* will guide the student in curriculum matters and admission requirements to professional schools of hospital administration, but the department in which he majors will guide him in his major work. The student should write for an official bulletin from each of the professional schools of his choice or from the Association of University Programs in Hospital Administration during his freshman year or as soon thereafter as possible and discuss with his adviser any special requirements of those particular schools. He should take the appropriate Graduate Record Examination and make application for admission to the professional schools of his choice about a year in advance of the expected date of matriculation.

FRESHMAN YEAR											
First Quarter				Second Quarter				Third Quarter			
BI	101	Prin. Biol. & Lab.	5	BI	104	Biol. Human Affairs	5	PO	209	American Govt.	5
MH	160	Pre-Cal. w. Trig.	5			Group Req. I.	5			Group Req. II	3-5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
HY	101	World History	3	HY	102	World History	3	HY	103	World History	3
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1
PE		Physical Education	1	PE		Physical Education	1	PE		Physical Education	1
SOPHOMORE YEAR											
EC	200	Economics I	5	EC	202	Economics II	5	EC	274	Bus. & Econ. Stat.	5
ACF	211	Prin. of Accounting	4	ACF	212	Prin. of Accounting	4	SY	201	Intr. Sociology	5
		Group Req. III	5	PG	211	Psychology	5	PG	212	Psychology	3
EH		Literature*	3	EH		Literature*	3	EH		Literature*	3
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1

*EH 253-254-255 or EH 260-261-262.

The student must declare a major by the end of his sixth quarter.

JUNIOR AND SENIOR YEARS

During the junior and senior years the student will complete the following special requirements: (a) MN 241, 310, 346, PO 325, 501 or 502, SY 518, and (b) the requirements of his major to be selected from those listed under Symbols for Majors on page 86. Students should consult with the HA Adviser about recommended courses in the junior and senior year.

TOTAL—203 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITE I. MH 161 or 151.

GROUP REQUISITE II. A 200-level philosophy course.

GROUP REQUISITE III. EH 315 or 390 or SC 211.

A student should become acquainted with the requirements for his major to begin as early as possible the alignment of courses required.

Curriculum in Pre-Occupational Therapy (OT)

This curriculum is designed to prepare students for admission to professional schools of occupational therapy. The student should strive for a good college record to attain reasonable promise of being selected by the professional school of his choice. Completion of this curriculum does not guarantee admission to a professional school of occupational therapy. Competition for admission to the professional schools is keen with the number of qualified applicants exceeding the number of places available.

The *Pre-Occupational Therapy Adviser* will guide students in curriculum matters and professional school admission requirements. The student should write for official bulletins from the professional schools of his choice early in his freshman year and discuss with his adviser any special requirements of those particular schools. He should make official application for admission to the professional schools about a year in advance of the expected date of matriculation.

FRESHMAN YEAR											
First Quarter				Second Quarter				Third Quarter			
B1	101	Prin. Biol. & Lab.	5	ZY	250	Human Anatomy	5	PG	211	Gen. Psychology	5
		Group Req. I	5	PO	209	American Govt.	5	ZY	251	Physiology	5
EH	101	English Comp.	3	EH	102	English Comp.	3	EH	103	English Comp.	3
PA	211	Intr. Ded. Logic	3	PA	212	Intr. Scient. Reas.	3			Elective	3
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1
PE		Physical Education	1	PE		Physical Education	1	PE		Physical Education	1
SOPHOMORE YEAR											
SY	201	Intr. Sociology	5	SY	202	Social Problems	5	SY	220	Statistics	5
SC	211	Public Speaking	5	PG	330	Social Psychology	4			Group Req. II	5
PG	212	Psychology	3			Elective	3-5			Elective	3-5
EH	260	Literature	3	EH	261	Literature	3	EH	262	Literature	3
		ROTC or Elective	1			ROTC or Elective	1			ROTC or Elective	1

TOTAL 107 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITE I. AT 112 or 121.

GROUP REQUISITE II. An approved course in psychology.

RECOMMENDED ELECTIVES: ANT 203, HPR 385, 485, PA 218, SY 204, 302, 312.

Students who continue beyond the sophomore year should select courses from alternate group requisites and recommended electives listed above, subject to additional specific requirements of the chosen professional schools. Also recommended are one or more 200-level courses in philosophy and other courses in the humanities and social sciences.

Curriculum in Pre-Physical Therapy (PT)

This curriculum is designed to prepare students for admission to professional schools of physical therapy. The student should strive for a good college record to attain reasonable promise of being selected by the professional school of his choice.

The *Pre-Physical Therapy Adviser* will guide students in curriculum matters and professional school admission requirements. The student should

write for official bulletins from the physical therapy schools of his choice early in his freshman year and discuss with his adviser any special requirements of these particular schools. He should make official application for admission to the professional schools about a year in advance of the expected date of matriculation. Completion of this curriculum does not guarantee admission to a professional school of physical therapy. Competition for admission to the professional schools is keen with the number of qualified applicants exceeding the number of places available.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	103	Fund. Chem. & Lab.....5	CH	104	Fund. Chem. & Lab.....5	CH	203	Organic Chemistry.....5
MH	160	Pre-Cal. w. Trig.....5	MH	161	An. Geom. & Cal.....5	CH		Group Requisite.....3-5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
		Group Requisite.....3-5			Group Requisite.....3-5			Elective.....3-5
		ROTC* or Elective.....1			ROTC* or Elective.....1			ROTC* or Elective.....1
PE		Physical Education.....1	PE		Physical Education.....1	PE		Physical Education.....1
SOPHOMORE YEAR								
BI	101	Prin. Biol. & Lab.....5	BI	103	Animal Biol. & Lab.....5	PG	215	Quantitative Methods.....5
PG	211	Psychology.....5	PG	212	Psychology.....3			Group Requisite.....3-5
PS	205	Intr. Physics.....5	PS	206	Intr. Physics.....5			Elective.....3-5
EH	260	Literature.....3	EH	261	Literature.....3	EH	262	Literature.....3
		ROTC* or Elective.....1			ROTC* or Elective.....1			ROTC* or Elective.....1

*Students not taking Basic ROTC will substitute PD 209 and a one-hour elective.

TOTAL—107 QUARTER HOURS

GROUP REQUISITE. A minimum of nine hours in art, foreign language, (fifth quarter or above), music, philosophy, religion, or theatre.

Students who continue beyond the sophomore year should select courses in the humanities and social sciences, subject to additional specific requirements of the chosen professional schools. Especially recommended are ANT 203, PA 218, PO 210, SY 201, ZY 301, 302, and/or a 200-level course in philosophy.

Curriculum in Pre-Pharmacy (PPY)

The curriculum in pre-pharmacy is designed to meet the requirements for admission to the Auburn University School of Pharmacy, which is fully accredited by the American Council on Pharmaceutical Education. Complete information about the professional curriculum in pharmacy may be found on page 163.

To gain admission to the professional curriculum, a student must complete the basic two-year requirements below with a 1.00 (C) average or better and receive approval of his application for admission by the Admissions Committee of the School of Pharmacy. A student who does not qualify for admission to the School of Pharmacy after completion of eight quarters in pre-pharmacy at Auburn University but who meets University continuation in residence requirements may continue to register in pre-pharmacy only by special permission of the Deans of Pharmacy and Arts and Sciences. Completion of this curriculum does not guarantee admission to a professional school of pharmacy. Competition for admission to the professional schools is keen with the number of qualified applicants exceeding the number of places available.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH	103	Fund. Chem. & Lab.....5	CH	104	Fund. Chem. & Lab.....5	BI	101	Prin. Biol. & Lab.....5
MH	160	Pre-Cal. w. Trig.....5	MH	161	An. Geom. & Cal.....5	CH	105	Fund. Chem. & Lab.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
HY	101	World History.....3	HY	102	World History.....3	HY	103	World History.....3
		ROTC*.....1			ROTC*.....1			ROTC*.....1
PE		Physical Education.....1	PE		Physical Education.....1	PE		Physical Education.....1

First Quarter			SOPHOMORE YEAR			Third Quarter		
CH	207	Organic Chem. & Lab. 5	CH	208	Organic Chem. & Lab. 5	EH	304	Tech. Writing 3
SC	202	App. Speech Comm. 3	PS	206	Intr. Physics or	ZY	250	Human Anatomy 5
PS	205	Intr. Physics 5	BI	102	Plant Biology 5	PY	260	Pharmacy History & Orient. 3
		Elective* 3	EC	202	Economics II 5			Elective* 5
		ROTC* 1			ROTC* 1			ROTC* 1

* ROTC optional.

**Electives should be selected in consultation with the Pre-Pharmacy adviser.

TOTAL—98 QUARTER HOURS

Curriculum in Pre-Veterinary Medicine (PV)

The pre-veterinary medicine curriculum at Auburn is open only to students who are bona fide residents of the State of Alabama. *Minimum* requirements for admission to the School of Veterinary Medicine are the *first seven quarters* as listed below (123 quarter hours).

The student will be guided by the *Pre-Veterinary Medicine Advisers* regarding preparation for admission to the School of Veterinary Medicine. Should he declare a major, he will also be advised by the department in which he majors.

Applications for admission to the School of Veterinary Medicine must be submitted to the Dean of that school between January 15 and February 15 preceding the admission date. A minimum grade point average of 1.25 is required for admission; D grades in required academic courses are not acceptable. All course requirements must be completed by the end of the spring quarter preceding the date of admission, and all required courses in the physical and biological science categories must have been completed within six calendar years prior to the anticipated entrance date. Completion of this curriculum does not guarantee admission to a professional school of veterinary medicine. Competition for admission to the professional schools is keen with the number of qualified applicants exceeding the number of places available. (For further information, see School of Veterinary Medicine on page 167.)

See also Pre-Veterinary Medicine option in the curriculum in Animal and Dairy Sciences in the School of Agriculture.

First Quarter			FRESHMAN YEAR			Third Quarter		
CH	103	Fund. Chem. & Lab. 5	CH	104	Fund. Chem. & Lab. 5	BI	101	Prin. Biol. & Lab. 5
MH	160	Pre-Cal. w. Trig. 5	MH	161	An. Geom. & Cal. 5	CH	105	Fund. Chem. & Lab. 5
EH	101	English Comp. 3	EH	102	English Comp. 3	EH	103	English Comp. 3
HY	101	World History 3	HY	102	World History 3	HY	103	World History 3
		ROTC or Elective 1			ROTC or Elective 1			ROTC or Elective 1
PE		Physical Education 1	PE		Physical Education 1	PE		Physical Education 1

Second Quarter			SOPHOMORE YEAR			Third Quarter		
BI	103	Animal Biol. & Lab. 5	ADS	204	Anim. Biochem. & Nut. 5	PO	209	American Govt. 5
CH	207	Organic Chem. & Lab. 5	EH	141	Medical Vocabulary* 3			Group Req. I 3-5
PS	205	Intr. Physics 5	CH	208	Organic Chem. & Lab. 5			Group Req. I 5
		ROTC or Elective 1	PS	206	Intr. Physics 5			ROTC or Elective 1
					ROTC or Elective 1			

First Quarter			JUNIOR YEAR			Third Quarter		
ZY	300	Genetics 5	CH	204	An. Chem. & Lab. 5	CH	316	Phys. Chem. & Lab. 5
		Group Req. I 5	FL	II	Foreign Language 5	FL	III	Foreign Language 5
ADS	302	Feeds and Feeding 3	PS	210	Modern Physics 5			Group Req. II 3-5
BY	300	Gen. Microbiology 5			Group Requisite III 3			Group Req. III 3

*Ten hours of foreign language may be substituted for EH 141.

GROUP REQUISITES

GROUP REQUISITE I. These requisites must be earned in humanities and fine arts, and in the social sciences to meet the Liberal Education Program requirements of the University.

GROUP REQUISITE II. ADS 200, ANT 203, AS 361, CH 205, 209, 316, EC 200, MN 341, 342, EH 253-254-255 or 260-261-262, 350, 357, 358, 390, FL (see Degree Options below and page 266), HY 201, 202, MH 162, 163, 264, PA 202, 210, 211, 212, PH 301, PG 211, 212, PO 210 or 309 or 325, PS 210, SC 202, SY 201, ZY 504.

GROUP REQUISITE III. These requisites are to be chosen from courses offered by the following departments: AR, BY, TH, EC, EH, GY, HY, MU, PA, PG, PS, SC, SY, and ZY. EED 310 may also be taken.

DEGREE OPTIONS

Students in PV may obtain a Bachelor of Science degree by completing the first nine quarters of this curriculum, including foreign language through the first year sequence, *plus* (1) successfully completing the freshman year of the School of Veterinary Medicine, or (2) 40 hours of Group Requisite II and nine hours of Group Requisite III, or (3) completing the requirements for a major to be selected from those listed under Symbols for Majors on page 86. Options (2) and (3) must add up to a total of 201 quarter hours.

Special Curricula

Special curricula leading to the Bachelor of Science degree include chemistry, chemistry with biochemistry option, criminal justice, geology, laboratory and medical technology, mathematics, applied mathematics, physics, applied physics, and public administration.

Curriculum in Chemistry (CH)

The curriculum in chemistry meets the standards of the accrediting committee of the American Chemical Society. It prepares and trains students for careers in both pure and applied chemistry.

Training is offered in the fundamentals of the science, together with advanced courses in chemistry and physics. Electives should be chosen for their cultural value, and must be approved by the department head.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	General Chemistry	5	CH 112	General Chemistry	5	CH 113	General Chemistry	5
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History	3	HY 102	World History	3	HY 103	World History	3
	ROTC or Elective	1		ROTC or Elective	1		ROTC or Elective	1

SOPHOMORE YEAR

CH 204	An. Chem. & Lab.	5	CH 205	An. Chem. & Lab.	5	CH 303	Organic Chemistry	5
MH 264	An. Geom. & Cal.	5	PS 221	Gen. Physics II	4	PS 222	Gen. Physics III	4
PS 220	Gen. Physics I	4	MH 265	Lin. Diff. Equations	3	MH 266	Topics Lin. Algebra	3
	ROTC or Elective	4		Approved elective	3		Approved elective	3
PE	Physical Education	1		ROTC or Elective	1		ROTC or Elective	1
			PE	Physical Education	1	PE	Physical Education	1

JUNIOR YEAR

CH 304	Organic Chemistry	5	CH 305	Organic Chemistry	5	CH 509	Physical Chemistry	5
CH 507	Physical Chemistry	5	CH 508	Physical Chemistry	5	FL	German**	5
FL	German**	5	FL	German**	5	PS 305	Modern Physics	5
	Approved elective***	3		Approved elective	3		Approved elective	3

SENIOR YEAR

First Quarter		Second Quarter		Third Quarter	
CH 504	Organic Analysis (Qual.).....5	CH 511	Intr. Inorg. Chem.....5	CH 513	An. Chemistry.....5
CH 510	Intr. Inorg. Chem.....5	CH 512	Chem. Thermodynamics.....5		Elective.....5
	Group Requisite.....5		Elective.....3-5		Elective.....3-5
	Elective.....3		Elective.....3		Elective.....3

*Students not prepared for MH 161 must take MH 160 without credit.

**German through the first year sequence. (See page 269.)

***A maximum of six hours of advanced ROTC may be substituted for electives in the junior or senior year. Students will be certified to the American Chemical Society as Certified Graduates when they have made up the electives for which advanced ROTC was substituted.

TOTAL—205 QUARTER HOURS

GROUP REQUISITE: EC 200, PO 209, or SY 201.

APPROVED ELECTIVES

EC 200	General Economics.....5	HY 202	History of U.S.....5
EC 206	Socio-Economic Foundations of Contemporary America.....3	MU 373	Appreciation of Music.....3
EH 253-254-255 or EH 260-261-262	.....3-3-3	MU 374	Masterpieces of Music.....3
EH 350	Shakespeare's Greatest Plays.....3	PO 209	American Government.....5
EH 365	Southern Literature.....3	PG 211	Psychology.....5
GY 303	Geography of the Soviet Union.....3	SY 201	Introduction to Sociology.....5
HY 201	History of U.S.....5	TH 313	Theatre Appreciation I.....3

Alternate Curriculum in Chemistry (CH) (Biochemistry Option)

FRESHMAN YEAR

First Quarter		Second Quarter		Third Quarter	
CH 111	General Chemistry.....5	CH 112	General Chemistry.....5	CH 113	General Chemistry.....5
MH 161	An. Geom. & Cal.....5	MH 162	An. Geom. & Cal.....5	MH 163	An. Geom. & Cal.....5
EH 101	English Comp.....3	EH 102	English Comp.....3	EH 103	English Comp.....3
HY 101	World History.....3	HY 102	World History.....3	HY 103	World History.....3
	ROTC or Elective.....1		ROTC or Elective.....1		ROTC or Elective.....1
PE	Physical Education.....1	PE	Physical Education.....1	PE	Physical Education.....1

SOPHOMORE YEAR

CH 204	An. Chem. & Lab.....5	CH 205	An. Chem. & Lab.....5	BI 101	Prin. of Biol. & Lab.....5
MH 264	An. Geom. & Cal.....5	PS 221	Gen. Physics II.....4	CH 303	Organic Chemistry.....5
PS 220	Gen. Physics I.....4	MH 265	Lin. Diff. Equations.....3	PS 222	Gen. Physics III.....4
	ROTC or Elective.....1		Elective.....3		ROTC or Elective.....1
			ROTC or Elective.....1		

JUNIOR YEAR

BI 103	Animal Biol. & Lab.....5	CH 305	Organic Chemistry.....5	CH 509	Physical Chemistry.....5
CH 304	Organic Chemistry.....5	CH 508	Physical Chemistry.....5	BY 300	Gen. Microbiology.....5
CH 507	Physical Chemistry.....5	ZY 301	Compar. Anatomy.....5	ZY 524	Animal Physiology.....5
	Approved elective.....3		Approved elective.....3		Approved elective.....3

SENIOR YEAR

CH 518	Biochemistry.....5	CH 519	Biochemistry.....5	CH 520	Clin. Biochemistry.....5
FL	German**.....5	FL	German**.....5		German**.....5
EH 390	Adv. Composition.....5		Group Requisite.....5		Approved elective.....3-5
	Approved elective.....3		Approved elective.....3		Approved elective.....3

*Students not prepared for MH 161 must take 160 without credit.

**German through the first year sequence. (See page 269.)

TOTAL—204 QUARTER HOURS

GROUP REQUISITE: EC 200, PO 209, or SY 201.

APPROVED ELECTIVES

EC 200	General Economics.....5	HY 202	History of U.S.....5
EC 206	Socio-Economic Foundations of Contemporary America.....3	MU 373	Appreciation of Music.....3
EH 253-254-255 or EH 260-261-262	.....3-3-3	MU 374	Masterpieces of Music.....3
EH 350	Shakespeare's Greatest Plays.....3	PO 209	American Government.....5
EH 365	Southern Literature.....3	PG 211	Psychology.....5
GY 303	Geography of the Soviet Union.....3	SY 201	Introduction to Sociology.....5
HY 201	History of U.S.....5	TH 313	Theatre Appreciation I.....3

Curriculum in Criminal Justice (CJ)

The curriculum in criminal justice is designed to prepare students for careers in 1. the supervision and administration of law enforcement agencies (*law enforcement specialization*); 2. the custody, supervision and rehabilitation of offenders (*offender rehabilitation specialization*); and 3. as preparation for graduate studies in criminal justice.

FRESHMAN YEAR		
First Quarter		
GY 102	Prin. of Geography.....	5
	Group Req. I.....	3-5
EH 101	English Comp.....	3
HY 101	World History.....	3
PE	ROTC or Elective.....	1
	Physical Education.....	1
Second Quarter		
	Group Req. I.....	3-5
	Group Req. II.....	4-5
EH 102	English Comp.....	3
HY 102	World History.....	3
PE	ROTC or Elective.....	1
	Physical Education.....	1
Third Quarter		
	Group Req. I.....	3-5
	Group Req. II.....	4-5
EH 103	English Comp.....	3
HY 103	World History.....	3
PE	ROTC or Elective.....	1
	Physical Education.....	1
SOPHOMORE YEAR		
ACF 211	or 215 Acct.....	4-5
PO 209	American Govt.....	5
PG 211	Psychology.....	5
EH	Literature**.....	3
	ROTC or Elective.....	1
PO 210	Am. State & Local Govt.....	5
SY 201	Intr. Sociology.....	5
	Group Req. III.....	3-5
EH	Literature**.....	3
	ROTC or Elective.....	1
EC 200	Economics I.....	5
LE 260	Surv. of Law Enf.....	5
	Group Req. III.....	3-5
EH	Literature**.....	3
	ROTC or Elective.....	1

*PE requisites: **Second Quarter.** PEM 130, 132, PE 134, or 131. **Third Quarter.** PE 162, 150, or 102, or 103 as required.

**EH 253-254-255 or EH 260-261-262.

JUNIOR AND SENIOR YEARS

Students in both the *law enforcement specialization* and the *offender rehabilitation specialization* will complete EH 315; HPR 351 or 396 or 494 or 497; LE 262, 335, 454; PG 301 or 330; SY 204 or ANT 203 or PG 212; SY 304 or 308 or 520; SY 302; PO 325 or 327; PO 501 and 502 (PO 332 may be taken in lieu of 501, or PO 336 may be taken in lieu of 502, but in any case either PO 501 or 502 must be taken).

The student in the *law enforcement specialization* will complete LE 261, 361, 363, 461; PO 323 or 505 or 518; PO 515 or MN 344; and SY 505 or 525 or 550. The student in the *offender rehabilitation specialization* will complete CED 421; HPR 497 or 396; SW 375; three courses from SY 304, 525, 526, 530.

TOTAL—201 QUARTER HOURS

GROUP REQUISITE I. The student should take a minimum of ten hours in mathematics, or ten hours in philosophy, or ten hours in mathematics and philosophy, choosing the mathematics course or courses from MH 100, 140, 160, 161, 162, 163, and choosing the philosophy course or courses from PA 202, 210, 211, 212, 214, 216. Any mathematics or philosophy courses which are requisites to the student's major program will apply in fulfillment of this Group Requisite as well. Group Requisite I may be completed in either two or three quarters, depending upon the combination of courses chosen.

GROUP REQUISITE II. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104, CH 101-102-104 or 103-104 or 111-112-113, GL 101-102, 101-103, 102-103, 110-103, PS 205-206, or 220-221-222.

GROUP REQUISITE III. A minimum of 9 hours in humanities courses.

Curriculum in Geology (GL)

The undergraduate special curriculum in geology prepares the student broadly in all aspects of geological processes and principles. This should enable him to make a more intelligent selection of a graduate program of study that will permit specialization in one or more of the many aspects of the science—economic geology, geophysics, geochemistry, petrology, paleontology, ground water geology, or environmental geology, as well as other special fields from astrogeology to oceanography. Employment for the

geologist ranges from federal and state service through university or college and industrial programs to private consulting.

The following four-year program satisfies the requirements for graduation with a Bachelor of Science degree in geology. (See also geology major and minor under Majors and Minors in the General Curriculum, page 86.)

FRESHMAN YEAR									
First Quarter			Second Quarter			Third Quarter			
GL 110	Phys. Geology.....	5	BI 101	Prin. of Biol. & Lab.....	5	BI 102	Plant Biology or		
MH 161	An. Geom. & Cal.....	5	MH 162	An. Geom. & Cal.....	5	BI 103	Animal Biol. & Lab.....	5	
EH 101	English Comp.....	3	EH 102	English Comp.....	3	MH 163	An. Geom. & Cal.....	5	
HY 101	World History.....	3	HY 102	World History.....	3	EH 103	English Comp.....	3	
	ROTC or Elective.....	1	GL 115	Geol. Fld. Meth.....	2	HY 103	World History.....	3	
PE	Physical Education.....	1		ROTC or Elective.....	1		ROTC or Elective.....	1	
						PE	Physical Education.....	1	
SOPHOMORE YEAR									
CH	Chemistry*.....	5	CH	Chemistry*.....	5	CH	Chemistry*.....	5	
GL 205	Paleobotany.....	5	GL 206	Invert. Paleozoology.....	5	GL 210	App. Paleontology.....	5	
MH	Mathematics**.....	3-5	EH	Literature***.....	3		Elective.....	3-5	
EH	Literature***.....	3		ROTC or Elective.....	1	EH	Literature***.....	3	
	ROTC or Elective.....	1	PE	Physical Education.....	1		ROTC or Elective.....	1	
JUNIOR YEAR									
GL 301	Mineralogy I.....	5	GL 302	Mineralogy II.....	5	GL 305	Ign. & Met. Pet.....	5	
	Minor I.....	5		Minor I.....	5		Minor I.....	5	
PS	Physics****.....	4-5	PS	Physics****.....	4-5	PS	Physics****.....	4-5	
	Group Requisite.....	3-5					Elective.....	3-5	
SENIOR YEAR									
GL 401	Sed. Pet.....	5	GL 402	Struct. & Geotect.....	5	GL 411	Stratigraphy.....	5	
PO 209	American Govt.....	5	PO 210	State & Local Govt.....	5	GL 421	or 422 Eco. Geol.....	5	
	Minor II.....	5		Minor II.....	5		Minor II.....	5	

*Either CH 111-112-113 or another 15-hour sequence of general chemistry, with labs, with approval of departmental adviser.

**May be MH 264, or a statistics (BY 501) or computer science (IE 204) course approved by departmental adviser.

***EH 253-254-255 or EH 260-261-262.

****The 12-hour sequence PS 220-221-222, but a 15-hour sequence in general physics may be substituted with consent of departmental adviser.

TOTAL—202 QUARTER HOURS

GROUP REQUISITES AND MINORS

GROUP REQUISITES. A course in music, theatre, art, speech communication, or journalism.

MINORS. Two 15-hour minors (or one 30-hour double minor) should be selected from those listed under the General Curriculum with the advice and approval of the student's departmental adviser.

Curriculum in Laboratory Technology (LT) and Medical Technology (MDT)

This curriculum, leading to the degree of Bachelor of Science in Laboratory Technology or Medical Technology, is designed for men and women who wish to prepare for clinical and other laboratory positions in such fields as public health and bacteriology. Most of the graduates in this curriculum enter the field of clinical medicine as medical technologists. They should plan to attain status as Registered Medical Technologists by interning for one year in an approved hospital and then passing the National Registry of Medical Technologists written examination.

The *Medical Technology option* leads to the Bachelor of Science degree in Medical Technology (conferred by Auburn University). Degree requirements include successful completion of nine quarters of the laboratory technology curriculum and one year's satisfactory training in a hospital school of medical

technology approved by the Board of Schools of the American Society of Clinical Pathologists and by the Head of the Department of Chemistry at Auburn University. Graduates of this curriculum should plan to attain status as Registered Medical Technologists by passing the National Registry of Medical Technologists written examination.

Further requirements include: (1) Auburn University students transferring into medical technology must complete in the laboratory technology curriculum one academic year (54 hours) preceding the year of internship. (2) Transfers from other institutions who choose the medical technology option must complete the second and third years of the laboratory technology curriculum at Auburn prior to internship.

FRESHMAN YEAR		
First Quarter		
CH 111	Gen. Chem. & Lab.	5
MH 160	Pre-Cal. w. Trig.	5
EH 101	English Comp.	3
HY 101	World History	3
LT 101	Orientation	1
PE	Physical Education	1
Second Quarter		
BI 101	Prin. Biol. & Lab.	5
CH 112	Gen. Chem. & Lab.	5
EH 102	English Comp.	3
HY 102	World History	3
PE	Physical Education	1
Third Quarter		
BI 103	Animal Biol. & Lab.	5
CH 113	Gen. Chem. & Lab.	5
MH 161	An. Geom. & Cal.	5
EH 103	English Comp.	3
PE	Physical Education	1
SOPHOMORE YEAR		
CH 207	Organic Chem. & Lab.	5
PS 205	Intr. Physics	5
HY 103	World History	3
HPR 195	Health Science	3
CH 208	Organic Chem. & Lab.	5
PS 206	Intr. Physics	5
ZY 250	Human Anatomy	5
EH 141	Medical Vocabulary	3
CH 204	An. Chem. & Lab.	5
BY 300	Gen. Microbiology	5
ZY 251	Physiology	5
JUNIOR YEAR		
CH 518	Biochemistry	5
LT 301	Hematology	5
BY 446	Clin. Microbiology	5
HY 306	Contemp. Affairs	3
CH 519	Biochemistry	5
LT 404	Immunology I	5
ZY 511	Gen. Parasitology	5
CH 520	Clin. Biochemistry	5
LT 401	Adv. Hematology	5
	Group Requisite I	5
	Elective	5
SENIOR YEAR		
ZY 508	Micrology	5
EH 315	Bus. & Prof. Writing	3
	Elective	5
LT 402	Seminar	3
ZY 509	Histology	5
SC 202	App. Sp. Comm.	3
	Elective	10
LT 405	Immunology II	5
	Group Requisite II	5
PY 563	Public Health	5

TOTAL—205 QUARTER HOURS

GROUP REQUISITE I. EC 200, PO 209, or SY 201.

GROUP REQUISITE II. ZY 300, 310, or 524.

APPROVED ELECTIVES

EC 200	General Economics	5	HY 201	History of U.S.	5
EC 206	Socio-Economic Foundations of Contemporary America	3	HY 202	History of U.S.	5
EH 253-254-255 or EH 260-261-262		3-3-3	MU 373	Appreciation of Music	3
EH 350	Shakespeare's Greatest Plays	3	MU 374	Masterpieces of Music	3
EH 365	Southern Literature	3	PO 209	American Government	5
FL*	French or German	5-5	PG 211	Psychology	5
GY 303	Geography of the Soviet Union	3	SY 201	Introduction to Sociology	5
			TH 313	Theatre Appreciation I	3

*French or German through the first two quarters of the first year sequence as a minimum. (See page 269.)

Curriculum in Mathematics (MH)

This curriculum is designed to prepare students for graduate study and eventual careers as mathematicians. The General Curriculum should be used by students who prefer flexibility in the design of their program (see page 84).

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
FL		Foreign Language*.....5	FL		Foreign Language*.....5	FL		Foreign Language*.....5
MH	161	An. Geom. & Cal.*.....5	MH	162	An. Geom. & Cal.*.....5	MH	163	An. Geom. & Cal.*.....5
EH	101	English Comp.....3	EH	102	English Comp.....3	EH	103	English Comp.....3
HY	101	World History.....3	HY	102	World History.....3	HY	103	World History.....3
		ROTC or Elective.....1			ROTC or Elective.....1			ROTC or Elective.....1

SOPHOMORE YEAR

MH	264	An. Geom. & Cal.*.....5	MH	265	Lin. Diff. Equations.....3	MH	331	Intr. Mod. Alg. I.....5
		Natural Science†.....4-5	MH	266	Top. in Lin. Alg.....3			Natural Science.....4-5
EH		Literature††.....3			Natural Science.....4-5	EH		Literature††.....3
		ROTC or Elective.....1	EH		Literature††.....3			ROTC or Elective.....1
PE		Physical Education.....1	PE		ROTC or Elective.....1	PE		Physical Education.....1
					Physical Education.....1			

JUNIOR YEAR

FL		Foreign Language*.....5	FL		Foreign Language*.....5	FL		Foreign Language*.....5
MH	332	Intr. Mod. Alg. II.....5	MH	531	Intr. Mod. Alg. III.....5	MH	521	Analysis II.....5
		Elective†††.....3	MH	520	Analysis I.....5			Requisite.....3-5
					Elective.....3			Elective.....3

SENIOR YEAR

MH	522	Analysis III.....5	MH		Requisite.....5	MH		Requisite.....5
MH		Requisite.....3-5			Group Requisite.....5			Group Requisite.....5
		Elective.....5			Elective.....5			Elective.....5
		Elective.....3			Elective.....3			Elective.....3

*Completion of two languages, French, German, Russian, through the first year sequence or one of these languages through the second year sequence. (See page 266.)

††Students not prepared for MH 161 must take MH 160 without credit.

†The natural science requirement may be met by taking PS 220-221-222 or CH 111-112-113. If the 12-hour physics sequence is selected, an additional 3-hour elective will be needed to meet the 196-hour requirement.

†††EH 253-254-255 or 260-261-262.

†††Appropriate electives to meet the interests of the student may be selected in consultation with his departmental adviser.

TOTAL—196 QUARTER HOURS

GROUP REQUISITES

GROUP REQUISITES. These requisites are chosen from one of the following areas of social science: economics, education, history, political science, psychology, or sociology.

Curriculum in Applied Mathematics (AMH)

An important feature of this curriculum is the option for the student to concentrate, by means of technical electives, on an important area to which mathematics can be applied; one of the traditionally allied fields such as engineering, physical science, or computer sciences; or the more recently allied areas such as biology (ecological systems, cell models), behavioral science or managerial science.

This is a professional mathematics curriculum. Students who desire more flexibility or more emphasis on the liberal arts should pursue the GMH or MH curriculum.

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH	161	An. Geom. & Cal.*.....5	MH	162	An. Geom. & Cal.*.....5	MH	163	An. Geom. & Cal.*.....5
CH	103	Fund. Chem. & Lab. or.....5	CH	104	Fund. Chem. & Lab. or.....5	PS	220	Gen. Physics I.....4
BI	101	Prin. Bio. & Lab.*.....5	BI	102	Plant Biology or.....5	EH	103	English Comp.....3
EH	101	English Comp.....3	BI	103	Animal Biology.....5	HY	102	World History.....3
		ROTC or Elective.....1	EH	102	English Comp.....3			ROTC or Elective.....1
PE		Physical Education.....1	HY	101	World History.....3	PE		Physical Education.....1
					ROTC or Elective.....1			
			PE		Physical Education.....1			

SOPHOMORE YEAR**

MH	264	An. Geom. & Cal.*.....5	MH	269	Elem. Diff. Equations.....5	MH	331	Intr. Mod. Alg. I.....5
PS	221	Gen. Physics II.....4	PS	222	Gen. Physics III.....4			Group Requisite I.....5
HY	103	World History.....3	MH	266	Topics Lin. Algebra.....3	MH	362	Engr. Math. I.....3
IE	204	Computer Program.....3			Group Requisite II.....5			Elective.....3

JUNIOR YEAR**First Quarter**

MH 332	Intr. Mod. Alg. II.....5
MH 520	Analysis I.....5
	Group Requisite II.....5

Second Quarter

MH 521	Analysis II.....5
MH 567	Math. Statistics I.....5
	Group Requisite II.....5
	Elective.....3

Third Quarter

MH 522	Analysis III.....5
MH 588	Math. Statistics II.....5
	Group Requisite II.....5
	Elective.....3

SENIOR YEAR

MH 560	Intr. Num. Analysis.....5
MH 310	Intr. Cal. of Variations.....3
	Group Requisite I.....10

MH 561	Num. Matrix Analysis.....5
	Group Requisite I.....5
MH	Requisite.....3 or 5
	Elective.....3

MH 503	Engr. Math. II.....5
	Group Requisite I.....5
MH 506	Elem. Part. Diff. Equations.....5
	or
MH 528	Lin. Diff. Sys.....3

*Students not prepared for MH 161 must take MH 160 without credit.

**By the middle of the sophomore year the student is expected to be familiar with the basic programming language. He may gain this knowledge by taking either the two one-hour courses MH 163L and MH 264L or the two-hour course EE 202.

TOTAL—198 QUARTER HOURS**GROUP REQUISITES****GROUP REQUISITE I**

A minimum of 25 hours of requisite credit must be taken in areas especially concerned with the application of mathematics. At least 15 hours must be taken in the same area. The primary areas for such concentration are:

Bofany-Zoology	Physics	Civil Engineering
Chemistry	Psychology	Electrical Engineering
Economics	Aerospace Engineering	Industrial Engineering
Geology	Chemical Engineering	Mechanical Engineering

Lists of acceptable courses in each of these areas are available through the Departmental Office.

GROUP REQUISITE II

A minimum of 20 hours of requisite credit must be taken in the social sciences area and in the humanities and fine arts area with at least one course in each of the two areas. Students planning graduate study beyond the Master's level should include a foreign language in Group Requisite II; in such case they must also take a social science course of at least five hours credit.

Curriculum in Physics (PS)

The curriculum in physics provides a fundamental preparation for careers in the physical and allied sciences and a foundation for graduate study in physics and related fields.

Because of the role of physics in modern civilization, graduates find opportunities in industrial and governmental research and development; chemical, geological, biological, and mathematical physics; medical and dental research; environmental preservation and control; and teaching and/or research at the college or university level.

An outstanding feature of the curriculum is the senior research participation wherein investigations of basic experimental problems are undertaken under the supervision of senior staff members.

FRESHMAN YEAR**First Quarter**

CH 111	General Chem.....5
MH 161	An. Geom. & Cal.*.....5
EH 101	English Comp.....3
HY 204	Tech. & Civil**.....3
	ROTC or Elective.....1
PE	Physical Education.....1

Second Quarter

CH 112	General Chem.....5
MH 162	An. Geom. & Cal.*.....5
EH 102	English Comp.....3
HY 205	Tech. & Civil**.....3
	ROTC or Elective.....1
PE	Physical Education.....1

Third Quarter

CH 113	General Chem.....5
MH 163	An. Geom. & Cal.*.....5
PS 220	Gen. Physics I.....4
HY 206	Tech. & Civil**.....3
	ROTC or Elective.....1
PE	Physical Education.....1

SOPHOMORE YEAR

FL	German***.....5
MH 264	An. Geom. & Cal.*.....5
PS 221	Gen. Physics II.....4
EH 103	English Comp.....3
	ROTC or Elective.....1

FL	German***.....5
PS 222	Gen. Physics III.....4
IE 204	Computer Program.....3
MH 265	Lin. Diff. Equations.....3
	ROTC or Elective.....1

FL	German***.....5
PS 305	Intr. Mod. Physics.....5
PS 300	Elec. & Mag.....4
MH 266	Topics Lin. Algebra.....3
	ROTC or Elective.....1

JUNIOR YEAR

PS 301	Electromagnetism.....5
	Soc. Sci. Elective.....5
MH 501	Cal. Vector Frnct. Elective.....3

MH 506	Elem. Partial D.E.....5
PS 302	Electronics.....5
	Electives.....8

PS 303	Optics.....5
	Electives.....11

First Quarter			SENIOR YEAR			Third Quarter		
PS 501	Mechanics I.....	5	PS 502	Mechanics II.....	5	PS 504	Thermodynamics.....	5
PS 515	Mod. Physics I.....	5	PS 516	Mod. Physics II.....	5		Group Requisite.....	5
	Group Requisite.....	5		Group Requisite.....	5	PS 507	Adv. Lab. II.....	2
			PS 506	Adv. Lab. I.....	2		Electives.....	6

*Students not prepared for MH 161 must take MH 160 without credit.

**Students may substitute HY 101-102-103 for HY 204-205-206.

***Through the first year sequence as a minimum. French or Russian may be substituted. (See page 266.)

TOTAL—207 QUARTER HOURS

GROUP REQUISITES					
PS 505	Nuclear Physics	PS 535	Intr. to Solid State	PS 560	Astrophysics
PS 517	Biophysics	PS 545	Plasma Physics		

Curriculum in Applied Physics (APS)

This curriculum provides a foundation in physics and emphasizes several related technical fields to provide a broader base for persons who desire to enter industrial and governmental laboratories. Individuals wishing to pursue graduate work will find that this curriculum also provides adequate preparation for advanced study.

During the junior and senior years, 20 hours of specialized courses are designated as Group Requisite I. These are to be chosen from one of the following areas: chemistry; geology; aerospace, chemical, electrical or mechanical engineering; mathematics; or computer, environmental or nuclear science.

Students anticipating graduate work should complete French, German, or Russian through the first year sequence as a part of Group Requisite II. (See page 101.)

First Quarter			FRESHMAN YEAR			Third Quarter		
CH 111	General Chem.....	5	CH 112	General Chem.....	5	CH 113	General Chem.....	5
MH 161	An. Geom. & Cal.*.....	5	MH 162	An. Geom. & Cal.*.....	5	MH 163	An. Geom. & Cal.*.....	5
EH 101	English Comp.....	3	EH 102	English Comp.....	3	PS 220	Gen. Physics I.....	4
HY 204	Tech. & Civil**.....	3	HY 205	Tech. & Civil**.....	3	HY 206	Tech. & Civil**.....	3
	ROTC or Elective.....	1		ROTC or Elective.....	1		ROTC or Elective.....	1
PE	Physical Education.....	1	PE	Physical Education.....	1	PE	Physical Education.....	1
			SOPHOMORE YEAR					
MH 264	An. Geom. & Cal.*.....	5		Group Requisite I.....	5	PS 305	Intr. Mod. Physics.....	5
ME 205	Appl. Mech. Statics***.....	4	PS 222	Gen. Physics III.....	4		Group Requisite I.....	5
PS 221	Gen. Physics II.....	4	IE 204	Computer Program.....	3	PS 300	Elec. & Mag.....	4
EH 103	English Comp.....	3	MH 265	Lin. Diff. Equations.....	3	MH 266	Topics Lin. Algebra.....	3
TS 113	Tool Lab.....	1	TS 102	Eng. Drawing.....	2		ROTC or Elective.....	1
	ROTC or Elective.....	1		ROTC or Elective.....	1			
			JUNIOR YEAR					
PS 301	Electromagnetism.....	5	MH 506	Elem. Partial D.E.....	5	PS 303	Optics.....	5
	Group Requisite I.....	5	PS 302	Electronics.....	5	PS 521	Modern Electronics.....	5
MH 501	Cal. Vector Funct.....	3		Group Requisite I.....	5		Group Requisite II.....	5
				Group Requisite II.....	5			
			SENIOR YEAR					
PS 501	Mechanics I.....	5	PS 502	Mechanics II.....	5	PS 504	Thermodynamics.....	5
PS 515	Mod. Physics I.....	5	PS 516	Mod. Physics II.....	5		Physics Req.****.....	5
	Group Requisite II.....	5	PS 506	Adv. Lab. I.....	2	PS 507	Adv. Lab. II.....	2
				Elective.....	3		Elective.....	3

*Students not prepared for MH 161 must take MH 160 without credit.

**Students may substitute HY 101-102-103 for HY 204-205-206.

***Students selecting fields other than engineering for their specialization area (via Group Requisite I) may elect to take an additional course in that area as a substitution for ME 205.

****Students electing the nuclear science option under Group Requisite II must select a course other than PS 505 for this requirement.

TOTAL—207 QUARTER HOURS

GROUP REQUISITE I

Courses to be used to satisfy this requirement are to be selected by the student after consultation with and a recommendation by the department (s) in which the courses are to be taken and upon the approval of his adviser.

GROUP REQUISITE II

A minimum total of 20 hours of requisite credit must be taken in the social sciences area and in the humanities and fine arts area with at least one course in each of the two areas. Students planning graduate study should include a foreign language in Group Requisite II as mentioned above; in such case they must also take a social science course for at least five hours credit.

Curriculum in Public Administration (PUB)

This curriculum is designed to prepare students for careers in the administration of governmental units. An option in Pre-City Management is designed to prepare students for graduate work in City Management. This program may be worked out with the *Public Administration Adviser*.

FRESHMAN YEAR		
First Quarter		
PA 202	Ethics and Society.....5	PO 209
EH 101	Group Reg. I.....4-5	PO 210
HY 101	English Comp.....3	State & Local Govt.....5
PE	World History.....3	Group Reg. I.....4-5
	ROTC or Elective.....1	EH 102
	Physical Education.....1	English Comp.....3
		HY 102
		World History.....3
		ROTC or Elective.....1
		PE
		Physical Education.....1
SOPHOMORE YEAR		
Second Quarter		
SY 201	Intr. Sociology.....5	EC 200
ACF 211	Economics I.....5	EC 202
EH	Prin. of Accounting.....4	Economics II.....5
	Group Reg. II.....3-5	SY 202
	Literature*.....3	Social Problems.....5
	ROTC or Elective.....1	Group Reg. II.....3-5
		EH
		Literature*.....3
		ROTC or Elective.....1

*EH 253-254-255 or EH 260-261-262.

JUNIOR AND SENIOR YEARS

The student will complete the following: PO 300, 323, 325, 326, 327, 328, 329, 333, 501, 502, 514, 515, 518, 519, PG 211, SC 211; and at least 15 hours from the following: EH 315, MN 346, PO 260, 450-451.

TOTAL—201 HOURS**GROUP REQUISITES**

GROUP REQUISITE I. A minimum of 10 hours in one science, including corresponding laboratories, from the following: BI 101-102, 101-103, 101-104, CH 101-102-104, 103-104, GL 101-102, 101-103, 102-103, 110-103, PS 205-206, 220-221-222.

GROUP REQUISITE II. The student will choose any three courses from the following: Mathematics, HY 201, 202, PA 210, GY 203, JM 220, SC 202, FL through the first two quarters of the first year sequence as a minimum (See page 266).

Curriculum in Materials Engineering (MTL)

An interdisciplinary curriculum in materials engineering is administered by the Department of Mechanical Engineering in the School of Engineering. It is conducted cooperatively by academic departments of the schools of Engineering and Arts and Sciences through a faculty Materials Engineering Curriculum Committee. (See page 144).



School of Business

GEORGE R. HORTON, JR., *Dean*
H. ELLSWORTH STEELE, *Associate Dean*

The SCHOOL OF BUSINESS prepares students to become effective and socially responsible managers of business organizations and responsible citizens and leaders of society.

To achieve this goal, the School offers undergraduate programs leading to the Bachelor of Science in Business Administration. In addition, it offers graduate work for the degrees of Master of Business Administration (MBA), Master of Science (MS) in both Economics and Business, and the Master of Arts in College Teaching (MACT). More detailed information on these last programs may be found in the *Graduate School Bulletin*.

Curriculum

The undergraduate curriculum includes a two-year Pre-Business Program required of all students and a two-year Professional Option Program. These programs provide a balanced course of study for all students, with approximately one-half of the hours in business and economics courses and one-half in courses offered outside the School. The courses required have been selected so that all students will have access to the "common body of knowledge" as designated by the American Assembly of Collegiate Schools of Business.

The Pre-Business Program, a plan followed by all business students in their freshmen and sophomore years, provides a sound foundation of work in the arts and sciences, including courses in mathematics, humanities, social sciences, and natural sciences. This lower division program also includes some of the introductory business courses.

The Professional Option Programs are offered through the Departments of Accounting and Finance; Economics; Management; and Marketing and Transportation. The Professional Option plans allow each student to concentrate in an area of interest during the junior and senior years. The nine options available include: Accounting (AC), Finance (FI), Economics (EC), General Business (GB), Industrial Management (INM), Food Industry Management (FIM), Personnel Management and Industrial Relations (PIR), Marketing (MT) and Transportation (TN). Through these programs, the School seeks to develop in its students the analytical, decision-making and communication skills required of managers who lead modern organizations.

Admissions

Students who meet Auburn University's admission requirements as stated on page 17 may enter the Pre-Business Program directly from high school or they may transfer to it either from another school on campus or from another college or university.

Student Advising System

The Office of Student Affairs of the School of Business is responsible for orienting all new students, freshmen and transferees, to the School. All students report each quarter to Student Affairs, Thach 219, to plan their academic schedules and to obtain information.

Faculty members are available to all students for academic counseling and career guidance. Students are encouraged to seek advice on professional and academic questions from department heads and faculty through personal arrangements or appointments made by Student Affairs.

Cooperative Education Program

Business students are eligible to participate in the University's Cooperative Education Program (see page 27). This program allows students to combine academic training with actual business experience.

Pre-Business Program

The requirements of the six-quarter Pre-Business Program are given in the model below. Students who enter from high school register in this program until they complete all Pre-Business requirements. Students who enter by transfer and who have not yet completed all Pre-Business requirements, must register in the Pre-Business Program.

Before being admitted into a Professional Option Program, business students must complete all courses in the Pre-Business Program with a satisfactory academic record.

Six-Quarter Pre-Business Program

FRESHMAN YEAR			
First Quarter		Second Quarter	
MH 140	or MH 160 Science*.....5	MH 151	or 161† Science*.....5
EH 101	English Comp.....3	EH 102	English Comp.....3
	HY/AT/EH**.....3		HY/AT/EH**.....3
	ROTC or Elective.....1		ROTC or Elective.....1
PE 101	Fnds. of Phys. Ed***.....1	PE 102	Begin. Swim. or Group I Course.....1
SOPHOMORE YEAR			
EC 200	Economics I.....5	EC 202	Economics II.....5
EC 274	Statistics I.....5	MN 207	Data Process.....5
PG 211	Psychology I.....5	ACF 211	Intr. Acct.....4
	ROTC or elective.....1	MN 241	Bus. Law I.....4
			ROTC or elective.....1
		EH 315	B & P Report Writing.....3
		SC 202	or 211.....3 or 5
		ACF 212	Intr. Acct. II.....4
			ROTC or elective.....1
			Elective††.....5 or 3

*Ten hours of Science are required to be selected from any of the following courses: BI 101-102 and/or 103 or BI 101-104; CH 101-102-104 or CH 103-104; GL 101-102; PS 200 or 205-206.

**Students may take any combination of World History, HY 101-102-103, Technology and Civilization, HY 204-205-206, History of Art, AT 171-172-173, and Western World Literature, EH 260-261-262.

***May be taken the first or second quarter of student's freshman year. (See page 240 for details.)

†Students entering the INM and PIR curricula should take MH 151.

††Electives may be from any area, subject to departmental requirements. Note especially the Food Industry Management curriculum. During the four years of study a minimum of 40 per-cent of all hours required for graduation must be taken in Business and Economics and a minimum of 40 per-cent in non-business subjects. The remaining hours may be from any area. The non-business subjects must include a minimum of 20 quarter hours in (A) Humanities and Fine Arts and (B) Mathematics-Natural Science electives in addition to the freshman requirements. At least one course must be taken in each category.

†††Students who have not taken typewriting in high school are strongly encouraged to take VED 200.

Department of Accounting and Finance

Accounting (AC)

A sound knowledge of the fundamentals of accounting is essential to success in any economic endeavor. Accounting is the language of business, and accounting procedures and records are the basic ingredients for sound management decision-making in both business and non-business organizations, including public and philanthropic bodies. Financial reports are required by the Securities and Exchange Commission with the sale of stocks and bonds which form the capital structure of our economic society. They are the basis for determining income taxes due federal and state governments.

The Professional Option Program in Accounting provides broad training in business and financial management. The student is required to take seven basic accounting courses above the sophomore principles courses, and may elect other courses to provide an emphasis in a particular field of managerial or public accounting.

FRESHMAN AND SOPHOMORE YEAR

(See Pre-Business Program, page 104)

JUNIOR YEAR		
First Quarter		
ACF 310	Mgt. Cost & Bdgt.....	5
ACF 311	Inter. Acct.....	5
MN 310	Prin. of Mgt.....	5
	Elective.....	3
Second Quarter		
ACF 312	Inter Acct.....	5
ACF 361	Prin. of Bus.....	5
	Finance.....	5
	Elective.....	5
	Elective.....	3
Third Quarter		
ACF 314	Income Tax.....	5
MT 331	Prin. of Mkt.....	5
	Elective.....	5
SENIOR YEAR		
ACF 410	Cost Acctng.....	5
EH 415	Written Bus. Comm.....	3
	Acct. Elective.....	5
	Elective.....	5
	Elective.....	0
MN 480	Bus. Policy.....	5
	Acct. Elective.....	5
	Elective.....	5
	Elective.....	0
ACF 416	Auditing.....	5
ACF 499	Current Topics.....	1
	Elective.....	5
	Elective.....	4

TOTAL—207 QUARTER HOURS

Electives should be chosen in consultation with adviser. See catalog description of courses.

Finance (FI)

In a modern capitalistic society, the influence and the responsibilities of financial executives have been expanding dramatically in recent years. Financial officers are involved in the most profound decisions affecting the strategy of business operations. They decide to expand, merge, contract, and change. They are concerned not only with the pricing of products, but with the initial decision to produce them. All aspects of business affairs ultimately reduce to dollar terms, and the financial officer's intimate and critical knowledge of the intricacies of financial operations place him in a vital role in corporate management.

The Professional Option Program in Finance offers students an opportunity to specialize in personal and institutional finance. Courses in real estate and insurance are available.

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 104)

JUNIOR YEAR					
First Quarter		Second Quarter		Third Quarter	
ACF 310	Mgt. Cost & Bdgt.....5	ACF 363	Adv. Bus. Fin.....5	ACF 320	Risk & Ins.....5
ACF 361	Prin. of Bus. ....5	MT 331	Prin. of Mkt.....5		Elective.....5
	Finance.....5	MN 310	Prin. of Mgt.....5		Elective.....5
ACF 367	Money Mkts. & Financial Inst.....5				Elective.....3
	Elective.....3				
SENIOR YEAR					
ACF 464	Investments.....5	ACF 466	Security Analysis.....5	MN 480	Bus. Policy.....5
EH 415	Written Bus. Com.....3		Dept. Elective.....5		Dept. Elective.....5
	Fin. Elective.....5		Elective.....5		Elective.....5
	Elective.....5		Elective.....3		
TOTAL—207 QUARTER HOURS					

Three categories of electives are included in the curriculum as follow: elective, finance elective, and departmental elective. These should be chosen in consultation with the adviser. See catalog course descriptions.

Department Of Economics

Business Economics (EC)

Businessmen, public officials, and educators must understand the economic environment in which they live and function if they are to make sound management decisions. The Business Economics Professional Option provides the student with a sound foundation for an administrative or managerial position. The Business Economics curriculum gives the student maximum flexibility in preparing for job opportunities. The foundation provided by the common body of knowledge courses in economics, the other social sciences and business along with selected electives will equip the Business Economics student to work in marketing, management, accounting, or statistics, and in addition, provides excellent preparation for graduate or professional studies. (See also Economics Major in the School of Arts and Sciences.)

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 104)

JUNIOR YEAR														
First Quarter					Second Quarter					Third Quarter				
EC	551	Inter. Micro-			ACF	361	Prin. of Finance.....	5		MT	331	Prin. of Mkt.....	5	
		economics.....	5		EC	556	Inter. Macro-					Social Science Elec.....	5	
MN	310	Prin. Mgt.....	5				economics.....	5				Dept. Elective.....	5	
		Humanities Elective.....	3-5				Social Science Elec.....	5						
		Elective.....	5-3											
SENIOR YEAR														
Second Quarter					Third Quarter					Fourth Quarter				
EH	415	Written Bus. Com.....	3		EC	554	Hist. Ec. Thought.....	5		MN	480	Bus. Policy.....	5	
		Dept. Elective.....	5				Dept. Elective.....	5				Dept. Elective.....	5	
		Dept. Elective.....	5				Elective.....	5				Elective.....	5	
		Elective.....	5				Elective.....	5						
TOTAL—201 QUARTER HOURS														

Economics departmental electives are any EC designated courses except EC 206.

Department of Management

The success or failure of any business is dependent upon the quality of its management. Business managers must acquire and effectively utilize physical, financial, and human resources to ensure an organization's survival and growth. In order to make sound decisions, the manager must be knowledgeable in basic business functions as well as the process of management.

The professional options within the management department are designed to impart knowledge which will assist future managers to be good decision makers for their organizations.

General Business (GB)

The General Business Professional Option focuses on the management of the functional areas inherent in business operations. It provides a number of elective courses which permit students to develop a concentration in a specific area or to broaden their education in several functional areas.

FRESHMAN AND SOPHOMORE YEARS (See Pre-Business Program, page 104)

First Quarter			JUNIOR YEAR			Third Quarter		
ACF 310	Mgt. Cost & Bdgt.....	5	MN 346	Human Rel. in Mgt.....	5	ACF 361	Prin. of Finance.....	5
MT 331	Prin. of Mkt.....	5	MN 380	Industrial Mgt.....	5	MN 242	Business Law II.....	4
MN 310	Prin. of Mgt.....	5		Humanities Electives*.....	3		Humanities Elective*.....	3
	Humanities Elective*.....	3		Elective**.....	3		Elective**.....	5
Second Quarter			SENIOR YEAR					
MN 442	Personnel Mgt.....	5	EH 415	Written Bus. Comm.....	3	MN 480	Bus. Policies.....	5
MN 482	Mgt. Info. Sys.....	5		Business Elective**.....	5		Elective***.....	5
	Elective**.....	5		Business Elective**.....	5		Elective.....	5
				Elective.....	5		Elective.....	3

TOTAL—207 QUARTER HOURS

*Humanities Electives must be selected from Economics, History, Literature, Philosophy, Political Science, Psychology, or Sociology.

**Business electives must be selected from the 300 or 400 level course offerings of the School of Business.

***MT elective must be a 300 or 400 level course

Industrial Management (INM)

The Professional Option Program in Industrial Management concentrates on manufacturing businesses. It requires study in computer applications, quantitative methods, human relations, management, and the utilization of these studies in management decision-making. Also, the student is permitted some free electives which he may use to study areas outside the School of Business.

FRESHMAN AND SOPHOMORE YEARS (See Pre-Business Program, page 104)

First Quarter			JUNIOR YEAR			Third Quarter		
MN 310	Prin. of Mgt.....	5	MN 380	Industrial Mgt.....	5	ACF 361	Prin. of Finance.....	5
ACF 310	Mgt. Cost & Bdgt.....	5	MN 346	Mgt. Hum. Rel.....	5	MT 331	Prin. of Mkt.....	5
TS 100	Intr. Mfg. Proc.....	2	MN 443	Problems in PIR.....	5	MN 381	MGT. D.M.I.....	4
	Humanities Elective*.....	5	TS 113	.....	1		Humanities Elective*.....	3
Second Quarter			SENIOR YEAR					
MN 482	Mgt. Info. Sys.....	5	MN 484	Oper. Mgt.....	5	MN 480	Bus. Policies.....	5
MN 382	Mgt. D.M. II.....	4	EH 415	Written Bus. Comm.....	3		Dept. Elective**.....	5
	Dept. Elective**.....	5		Dept. Elective**.....	5		Elective.....	5
	Elective.....	5		Elective.....	5			

TOTAL—207 QUARTER HOURS

*Humanities Electives must be selected from Economics, History, Literature, Philosophy, Political Science, Psychology, or Sociology.

**Departmental Electives must be selected from the 300 and 400 level courses of the Management Department.

Food Industry Management (FIM)

The Food Industry Management Option is oriented toward the vast food processing industry. Students in this option follow the basic INM curriculum and, with the counsel of an adviser from the food science faculty, elect appropriate courses in the area of food science and technology which replace a corresponding number of department and other electives in the INM program. Students selecting this program should make their wishes known as soon as possible to the Office of Student Affairs of the School of Business so that they may be assigned a faculty adviser in the food science areas.

FRESHMAN YEAR			
First Quarter		Second Quarter	
MH 140	College Algebra or	MH 151	Finite Math.....5
MH 160	Pre. Cal. w. Trig.....5		Chemistry or Biology*.....5
EH 101	Chemistry or Biology*.....5	EH 102	English Comp.....3
	English Comp.....3		HY/EH/AT.....3
	HY/EH/AT.....3		ROTC or Elective.....1
	ROTC or Elective.....1	PE	Physical Education.....1
PE	Physical Education.....1		
SOPHOMORE YEAR			
EC 274	Statistics I.....5	EC 202	Economics II.....5
EC 200	Economics I.....5	BY 220	Intr. Microbiology.....5
ADS 201	Food Science and Technology.....5	ACF 211	Intr. Acct. I.....4
	ROTC or Elective.....1	SC 202	Speech**.....3
			ROTC or Elective.....1
JUNIOR YEAR			
MN 310	Prin. of Mgt.....5	MN 380	Industrial Mgt.....5
ACF 310	Mgt. Cost. & Bdgt.....5	MN 346	Mgt. Hum. Rel.....5
HF 340	Indust. Food Pres. Tech.....5	MN 443	Prob. in PIR.....5
TS 100	Intr. Mfg. Prod.....2	NF 372	Fnds. Nutrition.....3
		TS 113	.....1
SENIOR YEAR			
MN 482	Mgt. Info. Sys.....5	MN 484	Oper. Mgt.....5
MN 382	Mgt. D.M. II.....4	ADS 415	Food Plant Sanitation.....3
	Elective.....5		Elective.....5
	Food Science Elec***.....3		Food Science Elec***.....3
		MN 480	Bus. Policies.....5
		EH 415	Written Bus. Comm.....3
			Elective.....5
			Food Science Elec***.....3

TOTAL—207 QUARTER HOURS

*Chemistry is preferable.

**SC 311 may be substituted.

***Food science elective. May be selected from ADS 310, 312, 410, 412, 413, 414, HF 341 and 342.

Personnel Management and Industrial Relations (PIR)

The Personnel Management and Industrial Relations Program prepares students for managing personnel and industrial relations activities. It blends a variety of subject matter into decision-making patterns that may be used to work with individual employees and unions. In addition, the program provides some free electives to pursue studies of personal interest. Students should take SY 201 for five of their elective hours in Pre-Business.

FRESHMAN AND SOPHOMORE YEAR

(See Pre-Business Program, page 104)

JUNIOR YEAR			
First Quarter		Second Quarter	
EC 574	Statistics II.....5	MN 442	Personnel Mgt.....5
MN 310	Prin. of Mgt.....5	MT 331	Prin. of Mkt.....5
EC 350	Labor Economics.....5		Depl. Elective**.....5
	Humanities Elective*.....3		Humanities Elective*.....3
Third Quarter			
		ACF 361	Prin. of Bus. Fin.....5
		EC 544	Labor Legis.....5
		MN 346	Mgt. Hum. Rel.....5
			Humanities Elective*.....3

SENIOR YEAR

Second Quarter

MN 444	First Quarter	5
MN 450	Coll. Bar. Arb.	3
MN 451	Pers. Selec. Plac.	3
	Man Power Plan	3
	Elective	5

MN 455	Pers. Org. Res.	3
MN 446	Pers. Adm. Leg.	3
	Dept. Elective**	5
	Dept. Elective**	5

MN 480	Third Quarter	5
MN 447	Bus. Policies	3
MN 415	Employee Comp.	3
	Written Bus. Comm.	3
	Elective	5

TOTAL—207 QUARTER HOURS

*Humanities Electives must be selected from Economics, History, Literature, Philosophy, Political Science, Psychology, or Sociology.

**Departmental Electives must be selected from the 300 and 400-level course offerings of the Department of Management.

Department of Marketing and Transportation

Marketing and Transportation are critical in the effective operation of business in the free world. Students gain the foundation to understand the entire corporate philosophy which affects every phase of the business programs—from initial product conception to the delivery of satisfaction to the final customer. Marketing majors discover the interrelationship of marketing to other management tools and prepare themselves for such careers as sales, advertising, marketing research, product planning, and merchandising. Transportation majors complete a course of study which prepares them for careers in carrier, physical distribution, and industrial traffic management and for assignments in regulating agency administration, in urban transportation and development planning, and as traffic and transportation specialists.

Marketing (MK)

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 104)

JUNIOR YEAR

Second Quarter

MN 310	First Quarter	5
MT 331	Prin. of Mgt.	5
SY 201	Prin. of Mkt.	5
	Sociology	5
	Elective	3

ACF 361	Prin. of Finance	5
MT 336	Quant. Anal. Mkt.	5
MT 341	Consumer Analysis	5

Third Quarter

	Dept. Elective	5
	Dept. Elective	5
	Elective	5
	Elective	3

SENIOR YEAR

EH 415	Written Bus. Comm.	3
	Directed Elective	5
	Dept. Elective	5
	Elective	5

MN 480	Bus. Policies	5
MT 498	Mkt. Strategy	5
	Elective	5

	Directed Elective	5
	Elective	5
	Elective	5
	Elective	3

TOTAL—207 QUARTER HOURS

Transportation (TN)

FRESHMAN AND SOPHOMORE YEARS

(See Pre-Business Program, page 104)

JUNIOR YEAR

Second Quarter

MN 310	First Quarter	5
MT 372	Prin. of Mgt.	5
PQ 209	Econ. of Transp.	5
	American Government	5
	Elective	3

ACF 361	Prin. of Finance	5
MT 331	Prin. of Mkt.	5
MT 473	Logistics	5
	Elective	3

Third Quarter

MT 475	Tran. Reg. Ind.	5
	Dept. Elective	5
	Elective	5
	Elective	3

		SENIOR YEAR			
		First Quarter		Second Quarter	
EH 415	Written Bus. Comm.....	3	MN 480	Bus. Policies.....	5
	Dept. Elective.....	5	MT 476	Trans. Entrp. Mgt.....	5
	Elective.....	5		Directed Elective.....	5
	Elective.....	5			
		Third Quarter			
				Directed Elective.....	5
				Elective.....	5
				Elective.....	5

TOTAL—207 QUARTER HOURS

Departmental Electives may be chosen from the following lists according to student career goals:
Marketing: MT 337, 372, 432, 433, 434, 436, 437, 438, 440, 473, 481, 482, 483, ACF 310.
Transportation: MT 336, 337, 434, 437, 438, 440, 484, ACF 310.
Directed Electives may be chosen from business or non-business courses according to career goals upon approval of departmental advisers.



School of Education

JACK E. BLACKBURN, *Dean*
J. FOSTER WATKINS, *Associate Dean*
J. BOYD SCEBRA, *Assistant Dean*

THE SCHOOL OF EDUCATION is accredited by the National Council for Accreditation of Teacher Education for the preparation of teachers and school service personnel with the doctor's degree as the highest degree approved.

Professional preparation programs are provided for service in the fields of curriculum and teaching; administration and supervision; counselor education; and educational media. Undergraduate programs administered by the Graduate School lead to the degrees of Master of Education, Master of Science, Specialist in Education, and Doctor of Education. Programs for the preparation of personnel for social service and education related agencies are also provided with degree options through the doctorate.

Emphasis in all programs is upon the preparation of personnel who will be able to meet successfully the performance demands of the roles they assume in their professional positions. An effort is made through processes of Continuous Program Renewal to revise constantly programs based upon systematic evaluative-feedback data secured on the performance of graduates on the job.

Undergraduate Curricula

The following statements set forth requirements for the development of programs for students pursuing a teacher education curriculum. Scholastic requirements, requirements for the pre-professional program, the program of professional education, and the fields of teaching specialization are stated. A total of 210 quarter hours is required to complete the program which leads to the degree of Bachelor of Science in Education.

Scholastic Requirements

Students enrolled in the School of Education or those enrolled in other Schools who are pursuing the dual objectives program must meet the following scholastic requirements: a grade point average of 1.0 (on a 3 point scale) for admission to Teacher Education and a grade point average of 1.25 in all courses completed in professional education and in the teaching major and minor for admission to the professional internship. A grade point average of 1.5 in courses in education and the teaching major and minor is expected for graduation with certification.

Pre-Professional Requirements

The pre-professional program as outlined fulfills the liberal arts requirement for students preparing to enter a teacher preparation program leading to

professional certification as a teacher in elementary and/or secondary schools. A major portion of the pre-professional requirements will be completed prior to admission to the teacher education program.

English

EH	101-102-103	English Composition (3-3-3)	9
SC	202	Applied Speech Communication (3) or approved substitute. Literature (American, English or World)*	3
		Literature (American, English or World)*	6
			9

Social Science

HY	101-102-103	World History (3-3-3)	9
	or		
HY	204-205-206	Technology and Civilization (3-3-3)	9
SY	201	Introduction to Sociology (5)	5
		Approved Social Science electives selected from Economics, Geography, History, Political Science and Sociology*	10-15

Biological Science

BI	101	Prin. of Biology (5)	5
BI	102	General Plant Biology (5)**	
BI	103	General Animal Biology (5)	
BI	104	Biology in Human Affairs (5)	
ZY	250	Human Anatomy (5)***	
		Select 1	5

Physical Science

CH	101-102-103L	General Chemistry (2-2-1) or CH 103-104	
PS	204	Fnds. of Physics (5)****	
GL	101-102	Intr. Geology (5)	
AM	304	Meteorology (5)	
AY	310	Earth Science (5)	
PHS	100-101	Physical Science (5-5)†	
PHS	151-152	Physical Science (5-5)	
		Select 2	10

Mathematics

		Approved Math Course (5)	5
MH	281-282-283	(5-5-3)‡	13
MH	281-282	(5-5)*	10

Physical Education

PE	101-102 or Group I, Group II	(1-1-1)	3
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Orientation

		Career Exploration and Planning (2)	2
		Transfer Orientation (1)	1
		Introduction to Laboratory Exp. for Transfers (1)	1

Foundations of Education

FED	213	Human Development (5)	5
FED	214	Psychological Foundations of Education (5)	5

*Early Childhood Education majors

**Early Childhood and Elementary Education majors complete 15 hours

***Science Education majors and minors

****Health and Physical Education majors

†Early Childhood, Elementary and Special Education majors (BD, ECH, MR)

‡Elementary and Special Education majors (BD, ECH, MR)

Professional Requirements

This phase of the Teacher Education Program develops competence in the content and skills of professional teacher education. Required professional studies are concerned with the growth and development of the individual, the

nature of society, and the functions of education in society. The history and philosophy of education, the administration and organization of schools, curriculum development, teaching and learning processes, learning resources, and the evaluation of teaching effectiveness are explored.

Foundations of Education

The philosophical, social, and psychological Foundations of Education provide background resources and laboratory experiences essential to effective participation in the teaching profession. The field emphasizes the concepts, principles, and theories essential for understanding and improving educational practices in light of historical developments and current social needs. Formal classwork includes an analysis of historical, philosophical, social, and psychological considerations upon which the educational enterprise is based.

Foundations of Education provides the resources, methods and laboratory experiences for formulating, evaluating, and revising educational policies, curriculum designs, schemes of school organization and support, and strategies for teaching and learning. All students in the teacher preparation program will complete FED 320, Social Foundations of Education; and FED 480, Philosophical Foundations of Education. Evaluation of the aims and achievements of the educational enterprise as a whole is a concern of each of these Foundational studies. Also, required laboratory experiences, including the Pre-Teaching Field Experience and the Professional Internship, are evaluated in one or more of these Foundations courses.

Teaching and Programming

This phase of the teacher preparation program is designed to assist the student in acquiring the knowledge, understanding, and skills deemed essential for success in the different specializations. Curriculum development, methodology, teaching and learning resources, and evaluation of teaching effectiveness are emphasized in the various areas of specialization. Each student in the teacher preparation program will complete the courses listed under the school program in which he is preparing to teach. Admission to Teacher Education is a prerequisite for these courses.

Elementary Education

A. Early Childhood Education	
EED 304 Music and Related Arts	5
EED 320 Curriculum for Early Childhood Education I	10
EED 420 Curriculum for Early Childhood Education II	10
B. Elementary Education	
EED 301 Curriculum I: Language and Social Science	10
EED 304 Curriculum I: Music and Related Arts	5
EED 401 Curriculum II: Mathematics and Natural Sciences	10

Health, Physical Education, Recreation

A. Health Education	
HPR 414A Teaching in Elementary Schools and Secondary Schools, and	
HPR 423A Program in Area of Specialization (Major Field)	6
*Minor Field	3
B. Health and Physical Education	
HPR 414B Teaching in Elementary and Secondary Schools, and	
HPR 423B Program in Area of Specialization (Major Field)	6
*Minor Field	3

C. Health, Physical Education, Recreation composite major-minor	
See B above for Major Field	6
D Recreation Administration	
HPR 423C Program in Area of Specialization	3
SED 405 Teaching in Secondary Schools, or	
SED 410 Program in Secondary School (Minor Field)	
or	
IED or VED 415 Teaching in Elementary and Secondary Schools	
IED or VED 414 Program in Elementary and Secondary Schools	

Secondary Education

SED 405 Teaching in Secondary School, or	
IED 414 Teaching in Elementary and Secondary Schools (Major Fields, except English)*	3
SED 410 Program in Secondary School, or	
IED 423 Program in Elementary and Secondary Schools (Major Field, except English)*	3
SED 405 Teaching in Secondary School, or	
SED 410 Program in Secondary School (Minor Field) or	
IED, HPR, or VED 415 Teaching in Elementary and Secondary School, or	
IED, HPR, or VED 414 Program in Elementary and Secondary Schools (Minor Field)*	3

Special Education

A. Behavior Disturbance	
EED 301C Curriculum I: Language and Social Science	10
EED 304 Music and Related Arts	5
EED 401C Curriculum II: Mathematics and Natural Sciences	10
IED 4790 Materials and Methods for Teaching in Special Education	5
B. Early Childhood Education for the Handicapped	
EED 304 Music and Related Arts	5
EED 320E Curriculum for Early Childhood Education I	10
EED 420E Curriculum for Early Childhood Education II	10
IED 479S Materials and Methods for Teaching in Special Education	5
C. Mental Retardation	
EED 301D Curriculum I: Language Arts and Social Science	10
EED 304 Curriculum I: Music and Related Arts	5
EED 401D Curriculum II: Mathematics and Natural Sciences	10
IED 479P Materials and Methods for Teaching in Special Education	5
D. Speech Pathology	
IED 414N Teaching in Elementary and Secondary Schools	3
IED 423N Program in Elementary and Secondary Schools	3
IED 420N Organizing instruction for special education	5
IED 479N Methods & Materials for teaching in special education	5

*SED 411, SED 412, and SED 413 are required in major for students in English education.

Vocational and Adult Education

VED 410 Occupational Information**	3
VED 414 Program in Area of Specialization*	3
VED 415 Teaching in Area of Specialization*	3
VED 456 Learning Resources in Area of Specialization	3

*Teaching and Program courses VED 411 and VED 412, are required in major for students in home economics education.

**Elective for Industrial Arts majors.

Laboratory Experiences

The Laboratory Experiences Program provides sequential learning opportunities in public school and community settings for all students throughout the teacher preparation program. Laboratory experiences are provided primarily through the following programs: (1) **Pre-teaching Field Experience Program**, (2) **Extended Laboratory Experiences** including a para-professional level program for secondary majors, (3) **Cooperative Education Program**, and (4) **the Professional Internship**.

The Pre-teaching Field Experience Program provides an initial base-line laboratory experience for all students in the teacher preparation program. It is initiated in the course, Career Exploration and Planning (EED, SED, VED, HPR,

IED 101), with specific follow-up responsibilities assigned to the Foundations Department (FED 213, 214, and 320). Students are required to participate in the program a minimum of ten days at the beginning of the public school term in the fall quarter. This prerequisite for admission to the Professional Teacher Education Program involves the student in planning and evaluating learning experiences, counseling, participation in pre-school conferences and faculty study, school and community meetings, and involvement in actual teaching situations.

The Extended Laboratory Experiences Program is conducted concurrently with enrollment in professional education courses which provide experiences in the schools and communities.

The Co-operative Education Program provides laboratory experiences for certain students involved in the teacher preparation program on an alternating quarter arrangement with college attendance. (For description see page 27).

The Professional Internship is a full-time assignment in an off-campus school and community. Experiences include personal and professional contacts with various phases of community life and the application of concepts, skills and knowledge the student has acquired in classroom situations.

The student enrolls for 15 credit hours and devotes a full quarter to the internship. No additional coursework, correspondence or regular, is permitted during the internship quarter. The program is divided into orientation, off-campus experience, and evaluation. Students must be admitted to the Teacher Education Program prior to the Professional Internship and must have completed appropriate courses in their areas of specialization.

The Internship for students with a major or minor in art, theatre, health, physical education and recreation, industrial arts, music, speech communication, and speech pathology, requires experience in both elementary and secondary schools.

Students who have had teaching or other related experiences may satisfy the Internship through a special program which is offered for 10 quarter hours credit during the Summer Quarter. Students will be considered on an individual basis for the special program.

The following special credit options which emphasize laboratory experiences in undergraduate study are available in all undergraduate programs of the School of Education:

(See full description under Education in Course Descriptions.)

425. Professional Internship in Elementary School (15). Pr., senior standing, admission to teacher education prior to internship, appropriate professional courses.

446. Directed Independent Study (1-10). **450. Special Topics (1-5).** **495. Practicum (1-10).**

Other laboratory experiences for students are provided within the framework of courses in the Teacher Education Program.

Requirements for Fields of Specialization

Requirements listed below represent minimum hours for a major and a minor in the respective fields of specialization. The number of hours listed for each

field of specialization is exclusive of courses completed in pre-professional and professional education. The requirements also exclude the use of any course as partial fulfillment for both the major and the minor field of study. Curriculum check lists are available in departmental offices.

SUBJECT	MINOR	MAJOR
Adult Education	30	
Composite		80
Agricultural Education		
General Agriculture		75
Technical Agriculture		75
Art Education		
Composite		80
Behavior Disturbance		60
Business Education		
General Business		67
Secretarial Admin.		67
Composite		80
Business Management		
Management Services		
Distributive Education		
Composite		70
Early Childhood Education		46
Early Childhood Education for the Handicapped		60
Educational Media	28	
Elementary Education		48
English Composite Programs	33	64-88
Foreign Languages		51
Health Education	31	52
Health and Physical Education		56
Health, Physical Education and Recreation		
Composite		77
Home Economics		68
Composite		86-88
Industrial Arts	28	50
Composite		75
Basic Power Mech.		
Basic Metal Technology		
Basic Drafting and Design		
Mathematics	30	54
Composite		64-71
Mental Retardation		63
Middle School		70
Music	28	72
Composite		89
Instrumental and Choral		
Choral and Elementary School Music		
*Office Administration		66
*Recreation Admin.	34	79
Composite	100	
*Rehab. Services Ed.		57
Science		
Gen. Science		45
Biology Science		45
Gen. Physics	30	
Physics	28	42
Chemistry	30	45
Social Science		
Gen. Soc. Science		45
Economics	30	40
Geography	30	40
Sociology	30	40
History	30	40
Polit. Science	30	40
Psychology	28	
Behavioral Science Composite		
Behavioral Science—Psychology		70
Behavioral Science—Sociology		67
Speech Communication	32	47
Speech Pathology		
Composite		82
Theatre	35	58
Trade and Industrial Education		60

*Non-certification programs.

ADULT EDUCATION**Minor: 30 Hours**

VED 521	Guidance in the Public Sch.	5
VED 513	Nature of Adult Ed.	5
VED 425	Prof. Intern. in Voc. and Adult Ed.	5
VED 466	Tchg. Out-of-Sch. Groups	3
VED 569	Commun. Prog. in Adult Ed.	5
VED 591	Prob. in Tchg. the Disadv. Adult	5
Approved Elective		2

Composite 80 Hours

PG 407	Maturity and Aging	5
VED 521	Guidance in the Pub. Sch.	5
VED 510	Occupational Info.	3
VED 513	Nature of Adult Ed.	5
VED 556-F	Lrng. Res. in Area of Spec.	4
VED 466	Tchg. Out-of-Sch. Groups	3
VED 566	Commun. Prog. in Adult Ed.	5
VED 591	Prob. in Tchg. the Disadv. Adult or	5
EED 302	Curr. I Rdg. and Other Lang. Arts	5
SED 575	Prob. in Improv. of Rdg. at the	5
	Sec. Sch. Level	5
Teaching Concentration		40

AGRICULTURAL EDUCATION**Major: 75 Hours**

AS 301	Agricultural Marketing	5
AS 401	Farm Management	5
VED 404	Practicum in General Metals	5
VED 406	Practicum in Building Construction	5
AY 307	General Soils	5
AOS 200	Introductory Animal and	5
	Dairy Science	5
HF 221	Landscape Gardening	5
ZY 402	Economic Entomology	5
Approved Electives in Gen.		5
Agriculture or Technical Agriculture		35

ART EDUCATION**Composite Major: 80 Hours**

AT 111	Fundamentals—Mechanical linear perspective	5
AT 112	Fundamentals—Representational drawing	5
*AT 113	Fundamentals—Interpretive drawing	5
AT 121	Fundamentals—Problems in basic design	5
AT 122	Fundamentals—Three-dimensional-Clay-other media	5
**AT 123	Fundamentals—Advanced principles	5
AT 171	History World Art	3
AT 172	History World Art	3
AT 173	History World Art	3
AT 232	Trans. Water Color	5
AT 333	Opaque Water Color	5
AT 211	Basic Figure Drawing	5
AT 241	Relief Printmaking	5
AT 252	Wood or Stone Sculpture	5
AT 253	Metal Sculpture	5

*Prerequisites: AT 111 and AT 112

**Prerequisites: AT 121 and AT 122

Electives—16 hours to be selected from the following:

AT 231	Oil Painting	5
AT 221	Letter Typography	5
AT 271	Greek & Roman Art	3
AT 372	Renaissance Art	3
AT 373	Modern Art	3
CA 345	Creative Crafts	3
CA 375	Creative Ceramics	3
CA 385	Creative Weaving	3
CA 475	Creative Textile Design	3

BEHAVIOR DISTURBANCE**Major: 60 Hours**

AT 301	Elementary School Art	5
or		
AT 401	Art in Education	5

EED 300	Fundamentals of Reading Instruction	5
EED 396	Music for the Elementary Teacher	5
or		
MU 201	Fundamentals of Music	5
or		
MU 371	Introduction to Music	3
HPR 211	Sensorimotor Activities	3
IED 376	A Survey of Exceptionality	5
IED 378	An Introduction to Behavior Disturbance	5
IED 420	Organizing Instruction for Behaviorally Disturbed Children and Youth	5
IED 530	Learning Disabilities	5
PG 435	Behavior Pathology	4
Approved Electives		15
SC 550	Language Development for the young handicapped child	5

BUSINESS EDUCATION***A. General Business****Major: 67 Hours**

VED 200	201, 202 Typewriting I, II, III	9
ACF 211	212, 311, 312 Accounting	20
MN 207	Elec. Data Pro. Principles	5
VED 305	Records Management	3
MN 310	Principles of Management	5
MT 331	Principles of Marketing	5
MN 341	Business Law	5
EH 345	Business and Professional Writing	5
VED 420	Office Machines	5
MN 405	Administrative Management	5

B. Secretarial Administration**Major: 67 Hours**

VED 200	201, 202 Typewriting I, II, III	9
VED 210	211, 212, 300 Shorthand I, II, III, Transcription I	20
ACF 211	212 Accounting	10
MN 207	Elec. Data Pro. & Computer Prog.	5
VED 305	Records Management	3
MN 310	Principles of Management	5
MN 341	Business Law	5
VED 420	Office Machines	5
VED 422	Secretarial Procedures I	5

C. Business Management**Composite Major: 80 Hours**

VED 200	201, 202 Typewriting I, II, III	9
ACF 211	212, 311, 312 Accounting	20
MN 207	Elec. Data Pro. & Computer Prog.	5
MN 305	Records Management	3
ACF 340	Personal Finance or	3
MN 447	Job Evaluation	3
MN 341	342 Business Law	10
EH 345	Business and Professional Writing	5
EC 360	Money and Banking	5
VED 420	Office Machines	5
MT 331	Principles of Marketing	5

D. Management Services**Composite Major: 80 Hours**

VED 200	201, 202 Typewriting I, II, III	9
VED 210	211, 212, 300 Shorthand I, II, III, Transcription I	20
ACF 211	212 Accounting	10
IE 301	Elec. Data Pro. & Computer Prog.	5
VED 305	Records Management	3
MN 310	Principles of Management	5
ACF 340	Personal Finance	3
MN 341	Business Law	5
EC 350	Labor Economics	5
VED 420	Office Machines	5
VED 422	Secretarial Procedures I	5
MT 331	Principles of Marketing	5

*EC 200 and 202 to be taken in social science general education area. For the 5 hours of required mathematics MH 159 or 160 is recommended. MH 161 may profitably be used as an elective.

See Office Administration noncertification program on page 121.

DISTRIBUTIVE EDUCATION**Composite 70**

EC 202	Economics II	6
MT 331	Principles of Marketing	5
EC 274	Business & Economic Statistics I	5
ACF 340	Personal Finance	3
EC 350	Labor Problems	5
MT 432	Promotional Strategies, Pr. MT 331	5
MT 433	Retail Store Management	5
MT 434	Purchasing	5
MT 435	Marketing Problems	5
MT 438	Marketing Channel Systems	5
MN 442	Personnel Management	5
ED 458	Coordination & Supervision in VED	3
VED 346	Vocational and Adult Education	3
VED 462	Directed Work Experience	6
	Electives in area of interest	6

EARLY CHILDHOOD EDUCATION**Major: 46 Hours**

AT 301	Elementary School Art	5
EED 300	Fundamentals of Reading Instruction	5
EM 510	Media for Children	4
FCD 267	Child Development I: Principles and Theories	4
FCD 467	Parent Education	4
HPR 211	Sensorimotor Activities	4
MU 371	Introduction to Music	3
PG 350	Behavior Modification in Early Childhood	5
SC 273	Group Problem Solving Through Discussion	5
SC 450	Principles of Speech Correction	5
TH 307	Children's Theatre	
TH 308	Creative Dramatics	3

EARLY CHILDHOOD EDUCATION FOR THE HANDICAPPED**Major: 60 Hours**

EED 300	Fundamentals of Reading Instruction	5
FCD 267	Child Development I: Principles and Theories	4
FCD 268	Family I: Structure and Function of the Family	5
FCD 300	Approaches to Child Study	5
HPR 211	Sensorimotor Activities	3
IED 376	A Survey of Exceptionality	5
IED 377	Introduction to Mental Retardation or	
IED 378	An Introduction to Behavior Disturbance or	
IED 530	Learning Disabilities	5
IED 550	Language Development for the Young Handicapped Child	5
MU 371	Introduction to Music	3
PG 350	Behavior Modification in Early Childhood	5
MT 331	Principles of Marketing	5
Approved	Electives	15

EDUCATIONAL MEDIA**(School Library and Audio-Visual Personnel)****Minor: 26 Hours**

EM 300	Learning Resources	4
EM 510	Media for Children	4
EM 515	Media for Young Adults	4
EM 530	Reference Materials and Services	4
EM 540	Organization and Administration of Media Services	4
EM 550	Classification and Cataloging of Media	4
EM 495	Practicum in Media Service	4

ELEMENTARY EDUCATION**Major: 48 Hours**

AT 301	Elementary School Art	5
EED 300	Fundamentals of Reading Instruction	5
EM 510	Media for Children	4

HPR 212	Elementary School Activities	3
HPR 394	Elementary School Health Instruction	3
MU 371	Introduction to Music	3
SC 450	Principles of Speech Correction	5
Approved	Concentration	20

ENGLISH**Composite Major****Basic Core—40 hours**

EH 494	Introduction to Linguistics or	
EH 441	History of the English Language	5
SEH 401	Language Study for Teachers	5
EED 300	Fundamentals of Reading	5
SED 575	Problems in Improvement of Reading at the Secondary School Level	5
EH 390	Advanced Composition	5
SED 402	Rhetoric and Composition for Teachers	5
EH 357	Survey of American Literature or	
EH 358	Survey of American Literature	5
EH 451	Shakespeare or	
EH 452	Shakespeare	5

In addition to completing the Basic Core, students select one of the options below:

1. English/Language and Literature—47 hrs.	
Approved English electives (literature)	20
Approved English electives (non-literature)	5
Approved Auxiliary courses (Selected from at least two of the following areas: English, Journalism, Reading, Media, Speech Communication, Theatre, Foreign Languages, History, Religion, Philosophy, Sociology, Psychology Art, Music)	22
2. English/Journalism—47 hrs.	
Approved English electives, 300-400 level	20
JM 221 Beginning News Writing	3
JM 223 Reporting	3
JM 224 Copyreading and Editing	3
JM 321 Newspaper Makeup and Layout	3
JM 322 Feature Writing	3
(10 additional hours selected from)	
JM 323 Community Newspaper	5
JM 435 Magazine Editing and Production	5
JM 465 History and Principles of Journalism	5
3. English/Media—48 hrs.	
Approved English electives, 300-400 level	20
EM 300 Learning Resources	4
EM 510 Media for Children	4
EM 515 Media for Young Adults	4
EM 530 Reference Materials and Services	4
EM 540 Organization and Administration of Media Centers	4
EM 550 Classification and Cataloging of Media	4
EM 495 Practicum in Media Services	4
4. English/Speech Communication—47 Hrs.	
Approved English electives, 300-400 level	20
SC 200 Introduction to Undergraduate Study in Speech Communication	5
SC 201 Speech Communication Theories	5
SC 220 Fundamentals of Oral Interpretation of Literature	5
SC 273 Group Problem Solving Through Discussion	5
SC	elective
SED 201P Education: Communication Problems	2
5. English/Theatre—47 hrs.	
Approved English electives, 300-400 level	20
TH 107 Stagecraft I	1
TH 108 Stagecraft II	1
TH 109 Stagecraft III	1
TH 204 Fundamentals of Acting I: Voice	5
TH 205 Fundamentals of Acting II: Movement	5
TH 207 Stage Make-up	3
TH 304 Fundamentals of Stage Design	5
TH 404 Directing I	3
TH	elective
6. English/Foreign Language—47 hrs.	
Approved English electives, 300-400 level	20
Approved courses in Spanish, French or German	27

7. English/Secondary Reading—48 hrs.

Approved English electives, 300-400 level	20
EED 561 Individualizing the Classroom Reading Program	5
EM 515 Media for Young Adults	4
SED 570 Reading in the Content Areas of Secondary School	5
SED 576 The Reading of Adolescents	5
SED 201R Education: Improvement of Reading	2
SED 201P Education: Problems in Communication	2
SED 495 Practicum in Secondary School Reading	5

8. English/Comparative Literature—48 hrs.

Comparative Literature, to be selected from the following courses	30
EH 312 The European Novel	
EH 320 An Introduction to Drama	
EH 325 The Short Story	
EH 340 The Classical Background	
EH 360 Continental Fiction	
EH 571 Renaissance and Baroque	
EH 573 Romanticism	
EH 574 Realism to Naturalism	
EH 575 The Symbolist Movement in Literature	
FL 371-372-373 Survey of Russian Literature in Translation	
Approved auxiliary courses (Foreign Language, History, Philosophy, Religion, Psychology, Art History, Music History, Sociology)	18

Theatre

TH 107 Stage Craft I	1
TH 108 Stage Craft II	1
TH 109 Stage Craft III	1
TH 204 Fnd. Acting I: Voice	5
TH 205 Fnd. Acting II: Movement	5
TH 207 Stage Make-up	3
TH 304 Fnd. Stage Design	5
TH 404 Directing I	5

FOREIGN LANGUAGES**A. Spanish****Minor: 33 Hours**

FL 131 Spanish	5
FL 132 Spanish	5
FL 133 Spanish	5
FL 231 Spanish	5
FL 232 Spanish	5
FL 233 Spanish	5
Approved 300 level course	3

Major: 51 Hours

Minor Requirements	33
Approved 300-400 level courses	18

B. German**Minor: 33 Hours**

FL 151 German	5
FL 152 German	5
FL 153 German	5
FL 251 German	5
FL 252 German	5
FL 253 German	5
Approved 300 level course	3

Major: 51 Hours

Minor Requirements	33
Approved 300-400 level courses	18

C. French**Minor: 33 Hours**

FL 121 French	5
FL 122 French	5
FL 123 French	5
FL 221 French	5
FL 222 French	5
FL 223 French	5
Approved 300 level course	3

Major: 51 Hours

Minor requirements	33
Approved 300-400 level courses	18

HEALTH EDUCATION**Minor: 31 Hours**

HPR 195 Health Science	3
HPR 295 School and Community Health	3
HPR 396 Drug Use and Abuse	3
HPR 395 Health Instruction	3
HPR 495 First Aid	3
NF 119 Nutrition and Man	3
NF 353 Community—Family Health	3
Approved Health Electives	10

Major: 52 Hours

Minor Requirements	31
EH 141 Medical Vocabulary	3
HPR 496 Problems of Health Education and Health Observation of School Children	5
IED 476 Exceptional Child	5
PY 428 Public Health	5
Approved Health Elective	3

HEALTH & PHYSICAL EDUCATION**Major: 56 Hours****Skills and Concepts Courses:**

HPR 118 Skills and Concepts of Individual and Dual Activities I	3
HPR 119 Skills and Concepts of Individual and Dual Activities II	3
HPR 120 Skills and Concepts of Gymnastics	4
HPR 121 Skills and Concepts of Aquatics	2
HPR 122 Skills and Concepts of Team Sports	3
HPR 123 Skills and Concepts of Dance	4
HPR 195 Health Science	3
HPR 201 History and Principles of Physical Education	1
HPR 212 Elementary School Activities	1
HPR 295 School and Community Health	1
HPR 315 Kinesiology*	4
HPR 316 Evaluation and Measurement in Physical Education	3
HPR 395 Secondary School Health Instruction	3
HPR 405 Physiology of Exercise*	4
HPR 424 Intramurals and Officiating	3
HPR 495 Emergency Care and First Aid	3
ZY 251 Physiology	5

*Prerequisites: ZY 250-251, PS 200

**Prerequisites: ZY 250-251

HEALTH, PHYSICAL EDUCATION AND RECREATION**Composite: 77 Hours**

Major Requirements (Health and Physical Education) 56	
HPR 385 Principles of Recreation	3
HPR 386 Recreation Leadership	3
HPR 416 Adaptive Physical Education	3
Approved Elective in Health or Physical Education	3
HPR Teaching and Coaching (choice of 1 course) HPR 202, 203, 204, 206, 207, 208, 209, 210, 351	3
Approved Elective in Health Education	3
Approved Elective in Recreation	3

HOME ECONOMICS**Major: 68 Hours**

NF 104 Prin. of Food Prep	5
CA 113 Housing for Man	3
CA 115 Clothing and Man	3
CA 105 Fund. of Clothing	5
CA 116 Art for Living	3
NF 112 Nutrition and Man	3
NF 204 Meal Mgt.	5
CA 206 Garment Structures	3

HF 225	Flower Arranging	3
FCD 267	Child Development I: Prin. & Theory	4
FCD 268	Family I: Structure & Funct. of Family	5
FCD 347	Lab. Exp. with Young Children	2
CA 233	Home Equipment	
CA 303	The House	Select one 5
CA 313	Home Furnishings	
CA 343	Interior Home Problems	
FCD 323	Man the Consumer	3
CA 431	Man-Environmental Relations	2
FCD 443	Home Management Residence	5
Approved Electives		9

Composite

Major Requirements	68
Completion of A, B, C, D, or E	18-20

A. Clothing and Textiles

CA 225	Textiles	5
CA 416	Apparel Quality Analysis	5
CA 455	Flat Pattern Designing	5
Approved Electives		3-5

B. Family and Child Development

FCD 301	Child Development II Infancy & Pre School or	
FCD 302	Child Development III School Age &	
	Adolescence	4
FCD 305	Family II Mate Selection & Marital Interaction or	
FCD 306	Family III Patterns of Family Interaction	4
FCD 461	Management Problems in the Home	3
FCD 467	Parent Education	4
FCD 468	Woman's Changing Roles and Potentialities	3

C. Home Management and Family Economics

FCD 441	Family Financial Management	5
FCD 460	Management Problems in the Home	3
CA 490	Social Problems of Housing	5
Approved Electives		5

D. Home Management, Housing and Equipment

CA 233	Home Equipment	5
CA 303	The House	5
CA 313	Home Furnishings	5
CA 343	Interior Home Problems	5
CA 333	Lighting Design	3-5
CA 433	Food Equipment	
FCD 441	Family Financial Management	
FCD 460	Management Problems in the Home	3-5
CA 453	The Consumer and the Market	

E. Nutrition and Foods

NF 362	Problems in Community Nutrition	
NF 452	Family Nutrition	3
NF 578	Modern Views of Nutrition	3
NF 588	International Nutrition	3
NF 324	Food Preservation	3
CA 533	Food Equipment	3
Approved Electives		9-10

INDUSTRIAL ARTS EDUCATION**Minor: 28 Hours**

CA 345	Creative Crafts	3
TS 102	Graphical Communication and Design	2
TS 111	Woodworking	1
TS 112	Welding Science	1
TS 113	Machine Tool Laboratory	1
TS 114	Sheet Metal Design	1
TS 115	Foundry Technology	1
TS 307	General Metals or	
VED 404	Practicum in General Metals	5
TS 402	Advanced Wood or	
VED 406	Practicum in Building Construction and Maintenance	5
VED 246	Instructional Drawing	3
VED 403	Principles of Electricity	1
VED 407	Practicum in Electricity	4

Major: 50 Hours

Minor Requirements	28
TS 216 Plastics Technology	2
VED 409 Practicum in Electronics	4

VED 457	Graphic Arts	4
Elective in Metal Area		5
Elective in Power Area		5
Elective in Drawing Area		2

INDUSTRIAL ARTS**Composite: 75 Hours****Common Courses for A, B, and C Options**

TS 102	Graphical Communication and Design	2
TS 105	Engineering Drawing II or	
TS 108	Design for Management	2
TS 111	Woodworking	1
TS 112	Welding Science and Application	1
TS 113	Machine Tool Laboratory	1
TS 114	Sheet Metal Design and Fabrications	1
TS 115	Foundry Technology	1
TS 216	Plastics Technology	1
TS 307	General Metals or	
VED 404	Practicum in General Metals	5
TS 308	Gages and Measurements	5
TS 402	Advanced Woodworking or	
VED 406	Practicum in Building Construction and Maintenance	5
VED 246	Instructional Drawing	3
VED 403	Principles of Electricity	1
VED 405B	The School Shop	3
VED 407	Practicum in Electricity	4
VED 409	Teaching Electronics in Industrial Arts	4
VED 456	Learning Resources in Area of Specialization or	
EM 400	Learning Resources	4
VED 457	Practicum in Graphic Arts	4

Select 26 hours from A, B, or C below.

A. BASIC POWER MECHANICS

CA 345	Creative Crafts	2
MN 310	Principles of Management or	
PG 461	Industrial Psychology	5
VED 400	Introduction to Power Mechanics	5
VED 401	Practicum in Small Gasoline Engines	5
VED 402	Advanced Woodworking	5
Approved Elective		4

B. BASIC METAL TECHNOLOGY

CA 345	Creative Crafts	1
MN 310	Principles of Management or	
PG 461	Industrial Psychology	5
TS 405	Problems in Welding Engineering	5
TS 406	Problems in Machining	5
VED 400	Introduction to Power Mechanics	5
VED 401	Practicum in Small Gasoline Engines or	
VED 402	Advanced Woodworking	5

C. BASIC DRAFTING & DESIGN

BT 101	Introduction to Building	3
BT 102	Drawing and Projections	3
CA 345	Creative Crafts	2
MN 310	Principles of Management or	
PG 461	Industrial Psychology or	
BT 206	Materials and Construction	5
TS 104	Descriptive Geometry	2
TS 107	Graphical Analysis & Design	2
VED 400	Introduction to Power Mechanics or	
VED 401	Practicum in Small Gasoline Engines	5
Approved Elective		4
TS 307	General Metals	5
Electives		3

MATHEMATICS

Any 5 hour mathematics course in the minor, majors, or composites may be counted as fulfilling the pre-professional mathematics requirement.

MINOR: 31-34

MH 161	Analytic Geometry & Calculus I	5
MH 162	Analytic Geometry & Calculus II	5
MH 163	Analytic Geometry & Calculus III	5
MH 266	Topics in Linear Algebra	3
MH 331	Introduction to Modern Algebra I	5
MH 441	Geometry, A Modern View I	5
MH 467	Mathematical Statistics	5
Approved Mathematics Electives		3

EE 202, IE 204 or demonstrate proficiency in programming digital computers.....	0-3
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MAJOR: 45-54

MH 161 Analytic Geometry & Calculus I.....	5
MH 162 Analytic Geometry & Calculus II.....	5
MH 163 Analytic Geometry & Calculus III.....	5
MH 264 Analytic Geometry & Calculus IV.....	5
MH 331 Introduction to Modern Algebra I.....	5
MH 441 Geometry, A Modern View.....	5
MH 467 Mathematical Statistics.....	5
EE 202, IE 204, MH 408 or demonstrate proficiency in programming digital computers.....	0-5

Students majoring in mathematics must also complete either requirements 1 or 2, as follows:

1. MH 420 Analysis I.....	5
MH 421 Analysis II.....	5
MH 422 Analysis III or	
MH 332 Introduction to Modern Algebra.....	5
2. MH 266 Topics in Linear Algebra.....	3
Four additional mathematics courses to total at least 16 hours selected from the areas of algebra, geometry, and analysis with not all selections in the same area. 16	

COMPOSITE MAJOR: 64-71

MH 161 Analytic Geometry & Calculus I.....	5
MH 162 Analytic Geometry & Calculus II.....	5
MH 163 Analytic Geometry & Calculus III.....	5
MH 264 Analytic Geometry & Calculus IV.....	5
MH 285 Linear Differential Equations.....	3
MH 266 Topics in Linear Algebra.....	3
MH 331 Introduction to Modern Algebra I.....	5
MH 332 Introduction to Modern Algebra II.....	5
MH 441 Geometry, A Modern View I.....	5
MH 467 Mathematical Statistics.....	5
MH 301 History of Mathematics or	
MH 420 Analysis or	
Geometry elective.....	3-5

Students with a composite major must also complete either requirement 1 or 2

1. MH 460 Introduction to Numerical Analysis.....	5
MH 461 Numerical Matrix Analysis.....	5
MH 418 Analysis for Applied Mathematics.....	5
IE 204 Computer Programming.....	3
IE 301 Information Retrieval.....	3
IE 485 Computer Programming Systems.....	3
Approved electives in computer programming.....	6
2. EE 202, IE 204, or MH 408 or demonstrate proficiency in programming digital computers.....	0-5
MH 420 Analysis I.....	5
MH 421 Analysis II.....	5
MH 422 Analysis III.....	5
Algebra elective.....	5

MENTAL RETARDATION**Major: 63 Hours**

AT 301 Elementary School Art or	
AT 401 Art in Education.....	5
EED 300 Fundamentals of Reading Instruction.....	5
EED 396 Music for the Elementary Teacher or	
MU 201 Fundamentals of Music or	
MU 371 Introduction to Music.....	3
HPR 517 Physical Education for the Mentally Retarded.....	3
IED 376 A Survey of Exceptionality.....	5
IED 377 Introduction to Mental Retardation.....	5
IED 420 Organizing Instruction for Special Education.....	5
IED 530 Learning Disabilities.....	5
IED 550 Language Development for the Young Handicapped Child.....	5
IED 586 The Severely Mentally Retarded.....	5
Approved Electives.....	17

Middle School

The Middle School program prepares teachers for the junior high school grades. Students completing this curriculum are eligible for certification in two middle school-junior high school teaching fields.

MUSIC**Minor: 28 Hours**

MU 131, 132.....	10
Material and Organization of Music	
MU 187, 188, 189, 287, 288, 289.....	6
Applied Music, preferably in one area, but if in two areas four hours must be in one area.	
MU 352, 353.....	6
Music History II & III	
MU 361.....	3
Conducting I	
One of the following:	
EED 396 (if major interest is in Elementary School Music).....	3
Music for the Elementary Teachers or SID 494 (if major interest in music is instrumental music).....	3
Organization of Instrumental Music or SED 495 (if major interest is choral music).....	3
Organization of Choral Music	

Major: 72 Hours

Minor Requirements in Music.....	28
Band, Choir, Orchestra, or Choral Union.....	11
MU 133, 231, 232, 233.....	20
MU 351 Music History.....	3
MU 387, 388, 487, 488 Applied Music.....	5
MU 362 Conducting.....	1
SED 494 Organization of Instrumental Music or SED 495 Organization of Choral Music.....	3
Music Elective.....	1

Composite: 89 Hours

Major Requirements.....	72
Completion of A or B below.....	17

A. INSTRUMENTAL AND CHORAL

SED 494 or SED 495 (the one not completed in the music major).....	3
MU 113, 114, 115, 116, 117, 118, or 119.....	3
MU 477 Music Arranging.....	3
MU 409 Marching Band Techniques.....	3
MU 454 Instrumental Music Literature.....	3

B. CHORAL AND ELEMENTARY SCHOOL MUSIC

EED 396 Music for the Elementary Teacher.....	3
MU Electives.....	5
MU 478 Music Arranging.....	3
MU 452 Vocal Literature.....	3
MU 453 Choral Literature.....	3

OFFICE ADMINISTRATION

The Office Administration Program is a noncertification program designed to prepare students to become professional secretaries, administrative assistants or for other responsible positions in business, government, or professional offices.

OFFICE ADMINISTRATION**Major: 66 Hours**

VED 102 Orientation.....	1
VED 200-201-202-203 Typewriting I, II, III & IV.....	12
VED 210-211-212 Shorthand I, II & III.....	15
VED 300 Transcription.....	15
VED 305 Records Management.....	3
VED 430 Office Machines.....	5
VED 421 Office Internship.....	10
VED 422 Secretarial Procedure I.....	5
VED 423 Secretarial Procedure II.....	5
VED 524 Administrative Management.....	5

RECREATION ADMINISTRATION**Minor: 32 Hours**

HPR 385 Principles of Recreation.....	3
HPR 386 Recreation Leadership.....	3
HPR 387 Outdoor Recreation.....	3
HPR 388 Camp Management.....	3

HPR 423C	Program—Recreation	5
HPR 424	Intramurals and Officiating	3
HPR 485	Social Recreation	3
HPR 495	Emergency Care and First Aid	3
Approved Electives		6

Major: 70 Hours

Minor Requirements (Excluding HPR Electives)	26
HPR 118 Skills and Concepts of Individual and Dual Activities I	3
HPR 119 Skills and Concepts of Individual and Dual Activities II	3
HPR 120 Skills and Concepts of Gymnastics	4
HPR 121 Skills and Concepts of Aquatics (or HPR 351 Water Safety Instruction)	2 (3)
HPR 122 Skills and Concepts of Team Sports	3
HPR 123 Skills and Concepts of Dance	4
CA 345 Creative Crafts	2
TH 315 Recreational Dramatics (or TH 307 Children's Theatre)	3
JM 220 Survey of Communications Media	5
HPR 425C Professional Internship	15

Composite: Min. 100 Hours

Major Requirements	70
Completion of A, B, or C	30-37

A. Community Recreation (30 hours)

PO 323	Municipal Government in U.S.	5
MN 344	Environmental Law	4
MN 442	Personnel Management	5
EC 465	Public Finance (Pr. EC 201 and 202)	5
Approved Electives		11

B. Recreation Resource Management (30 hours)

HF 221	Landscape Gardening	5
AY 315	Turfgrass Management	5
FY 460	Wildland Recreation Philosophy and Policy	5
PO 260	Survey of Law Enforcement	5
Approved Electives		10

C. School-Community Recreation (37 hours)

HPR 480	School-Community Recreation	4
FED 213	Human Development	5
FED 214	Psychological Foundations of Education	5
FED 320	Social Foundations of Education	5
FED 480	Philosophical Foundations of Education	5
HPR 414B	Teaching in Health and Physical Education	3
HPR 423B	Program in Health and Physical Education	5
HPR 425B	Professional Internship in Health and Physical Education	5

REHABILITATION SERVICES EDUCATION**Major: 57 Hours**

VED 330	Careers in Rehabilitation	5
PG 212	Introduction to Psychology II	3
ANT 305	Culture and Personality	3
SY 406	Introduction to Social Welfare	5
VM 210	Human Physiology	5
SC 273	Group Problem Solving Through Discussion	5
CED 521	Guidance in the Public Schools	5
Approved Electives in Area of Specialization		25

SCIENCE**A. General Science****Major: 45 Hours**

CH 103-104	General Chemistry	10
BI 103	Biology	5
PS 205-206	General Physics	10
Approved Electives (5 hrs. must be from biological science)		20

*certification option

B. Biological Science**Minor: 30 Hours**

BI 103	Biology	5
ZY 250	Human Anatomy	5
ZY 251	Physiology	5
BY 300	General Microbiol.	5
ZY 300	Genetics	5
Approved Electives		10

Major: 45 Hours*

Minor Requirements	30
Approved Electives	15

*Requires CH 103-104 or equivalent

C. GENERAL PHYSICS**Minor: 30 Hours**

PS 205-206	Introductory Physics	10
PS 210	Principles of Modern Physics	5
PS 215	Astronomy	5
PS 417	Introduction to Biophysics	5
PS 470	Health Physics	5

D. Physics***Minor: 27 Hours**

PS 220	Gen. Physics I	4
PS 221	Gen. Physics II	4
PS 222	Gen. Physics III	4
PS 300	Intermediate Electricity and Magnetism	4
PS 305	Modern Physics	5
PS 302	Electronics	5
PS 412	Seminar	1

Major: 42 Hours

Minor Requirements		27
Approved Electives to be selected from:		
PS 415	Intr. to Quantum Mech.	
PS 421	Modern Electronics	
PS 303	Optics	
PS 435	Intr. to Solid State Physics	15

*Physics majors will complete minor in mathematics (including MH 361).

E. Chemistry**Minor: 30 Hours**

CH 103	General Chemistry	5
CH 104	General Chemistry	5
CH 105	General Chemistry	5
CH 207	Organic Chemistry	5
CH 208	Organic Chemistry	5
Approved Elective		5

Major: 45 Hours

Minor Requirements	30
Approved Electives	15

Prerequisites for CH 105. Credit in these courses applied to general education requirement in physical science.

SOCIAL SCIENCE

All students majoring in political science, sociology, economics, or geography, and not minoring in history; and all students minoring in political science, sociology, economics, geography or psychology and not majoring in history; must include in their social science general education requirements the following:

U.S. History	5 hours
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GENERAL SOCIAL SCIENCES**Major: 45 Hours**

HY 202	United States History	5
EC 200	Economics I	5
PO 209	Introduction to American Government	5
GY 102	or 203 Prins. of Econ. Geography	5
Approved elective from 300-400 course in U.S. History		5
Approved electives from 300-400 courses in sociology, economics, political science and geography		20

1. Economics Minor: 30 Hours

EC 200	Economics I	5
EC 202	Economics II	5
EC 456	Intermediate Macro Economics	5
EC 452	Comparative Economics Systems	5
Approved	300-400 level economics courses	10

Major: 40 Hours

Minor Requirements	30
EC 274 Business and Ec. Statistics I	5
Approved 300-400 level economics courses	5

2. Geography Minor: 30 Hours

GY 102	Principles of Geography	5
GY 203	Economic Geography	5
GY 405	Cultural Geography of the World	5
Approved	300-400 level courses in GY	15

Major: 40 Hours

Minor Requirements	30
Approved 300-400 level GY courses	10

3. Sociology Minor: 30 Hours

SY 202	Social Problems	5
ANT 203	Introduction to Anthropology	5
Approved	300-400 level Sociology courses	20

Major: 40 Hours

Minor Requirements	30
SY 304 Minority Groups	5
SY 308 Juvenile Delinquency	5

4. History Minor: 30 Hours

U.S. HY (5 hours above freshman level)	10
Selections from Latin American area	5
Selections from non-western, non-American area	5
Approved 300-400 level history courses	10

Major: 40 Hours

Minor Requirements	30
Selected 300-400 level courses in area of student's choice providing depth study in one area	10

5. Political Science Minor: 30 Hours

PO 209	National Government	5
PO 210	State Government	5
PO 309	Intr. to International Relations or	5
PO 312	An Intr. to Comparative Gov.	5
Approved	300-400 level PO Courses	15

Major: 40 Hours

Minor Requirements		30
PO 422	Recent and Contemporary Political Theory	5
PO 340	Political Parties and Politics, PO 323 Municipal Gov. in the U.S., PO 405 Metropolitan Area Gov. Problems or	5
PO 445	The Gov. and Politics of the Developing Nations	5

6. Psychology Minor: 30 Hours

PG 211	Psychology I	5
PG 212	Psychology II	3
PG 215	Quantitative Methods in Psychology	4
PG 330	Social Psychology	4
PG	Elective	14

7. Behavioral Science Composite: 67-70 Hours

Behavioral Science—Psychology	
PG 211	Psychology
PG 212	Psychology

PG 215	Quantitative Methods	5
PG 320	Experimental Psychology I: Learning	4
PG 321	Experimental Psychology II: Perception	4
PG 322	Experimental Psychology III: Personality	4
PG 330	Social Psychology	4
Electives in Psychology		11
SY 304	Minority Groups or	5
SY 420	Race and Ethnic Relations	5
SY 308	Juvenile Delinquency	5
Electives in Sociology		5
ANT 203	Introduction to Anthropology	5
Electives in Anthropology		10

Behavioral Science—Sociology

SY 220	Statistics	5
SY 304	Minority Groups or SY 420 Race and Ethnic Relations	5
SY 308	Juvenile Delinquency	5
SY 309	Social Thought or SY 402 Social Theory	5
Electives in Sociology		20
PG 211	Psychology	5
PG 212	Psychology	3
PG 330	Social Psychology	4
ANT 203	Introduction to Anthropology	5
Electives in Anthropology		10

SPEECH

Minor: 32 Hours

SC 201	Sp. Comm. Theories	5
SC 200	Intr. to Sp. Comm.	5
SC 273	Group Discussion	5
SC 220	Interpretive Reading	5
SC 230	Fundamentals of Radio and TV Broadcasting	5
SC 311	Public Speaking	5
SED 21P	Communication Problems	2

Major: 47 Hours

Minor Requirements	32
SC 278 Argumentation and Debate	5
Approved 300-400 level speech courses	10

SPEECH PATHOLOGY

Composite Major—82 Hours

SC 340	The Speech and Hearing Mechanism	5
SC 341	Phonetics	3
SC 350	Introduction to Speech Pathology—Audiology	5
SC 355	Clinical Procedures in Speech. (This course offered for 1-6 hours.)	6
SC 460	Introduction to Audiology	5
SC 461	Hearing Pathology	5
SC 462	Hearing Rehabilitation	5
SC 451	Articulation Disorders	5
SC 452	Language Disorders	5
SC 453	Fluency Disorders	5
IED 376	Intr. to Exceptionality	5
CED 421	Intr. to Guidance and Counseling	5
Approved	Electives	5

Completion of this program meets pre-professional certification requirements of the American Speech and Hearing Association. Additional work required: 200 clock hours in an approved Speech and Hearing Clinic or under the supervision of a certified Speech Pathologist.

Completion of A, B, C, or D or A Combination of Courses from the 4 Areas Select a Minimum of 20 or a Maximum of 30

A. Family and Child Development

FCD 157	Family and Human Development	5
FCD 204	Dynamics of Marriage	3
FCD 267	Child Development I	4
FCD 268	Family I	4
FCD 300	Approaches to Child Study	5

FCD 301	Child Development I	4
FCD 302	Child Development II	4
FCD 305	Family I	4
FCD 306	Family II	4
FCD 308	The Family and Child Mental Health	4
FCD 467	Parent Education	4

B. Behavior Disturbance

IED 378	Introduction to Behavior Disturbances	5
IED 4790	Teaching Behavior Disturbances	5
IED 580	Children with Special Learning Disabilities	5
PG 435	Behavior Pathology	4
PG 350	Behavior Modification for Early Childhood	5

C. Mental Retardation

IED 377	Introduction to Mental Retardation	5
IED 479P	Teaching Mentally Retarded	5
IED 586	Severely Retarded	5
VED 547	Vocational Training of Mentally Retarded	5
HPR 517	P.E. for Mentally Retarded	5
HPR 211	Sensorimotor Activities	3
IED 550	Language for the Handicapped Child	5

D. Psychology

PG 211	Psychology	5
PG 212	Psychology	3
PG 215	Quantitative Methods	5
PG 320	Experimental Psychology I: Learning	4
PG 330	Social Psychology	5
PG 350	Behavior Modification in Early Childhood	5
PG 435	Behavior Pathology	4
PG 415	Introduction to the Theory of Measurement	5

THEATRE

Minor: 35 Hours

TH 104	Intr. to Theatre I	3
TH 105	Intr. to Theatre II	3
TH 106	Intr. to Theatre III	3
TH 107	Stage Craft I	1
TH 108	Stage Craft II	1
TH 109	Stage Craft III	1
TH 204	Fund. of Acting I: Voice	5
TH 205	Fund. of Acting II: Movement	5
TH 207	Stage Make-Up	3
TH 304	Fund. of Stage Design	3
TH 404	Directing I	5

Major: 58 Hours

TH 201	Minor Requirements	35
TH 301	Theatre Artists in Society	3
TH 302	Theatre in Western Civilization	3
TH 303	Theatre in Western Civilization	3
TH 307	Children's Theatre or Creative Dramatics	3
TH 308	Costume	3
TH 405	Directing II	5

TRADE AND INDUSTRIAL EDUCATION

Major: 60 Hours

VED 475-	480 Trade and Industrial Exp.	30
EH 345	Business and Professional Writing	5
MN 310	Business Organization and Management	5
EC 350	Labor Economics	5
MT 331	Principles of Marketing	5
VED 458	Coord. and Supervision of VED	3
VED 246	Instructional Drawing	3
Approved Electives		4

†Credit for VED 475-480 (inc.) (5-5-5-5-5) by supervised employment or by examination on a basis of journeyman level work experience at the maximum rate of 15 quarter hours for each year of such experience. In those occupations where there is no organized apprenticeship experience beyond the level of learner, the level of learner will correspond to journeyman level. If employment experience required for certification is obtained prior to starting the curriculum, elective coursework may be substituted for these credits. Time required to complete curriculum would be reduced accordingly.

Dual Objectives Program

Students in other schools of the University who wish to complete requirements for graduation in an academic department and also to complete the degree requirements of the Teacher Education Program may pursue the dual objectives program.

A student electing to pursue the dual objectives program will have an adviser in the academic department in which he is enrolled and an adviser in the School of Education. Advising the student concerning the curriculum of the academic department, including the major, minor and other requirements, will be the responsibility of the adviser in that department. The responsibility for advising the student on matters concerning the Teacher Education Program, which includes General Education, areas of teaching specialization, and Professional Education, will be that of the adviser in the School of Education. The quarterly course schedule of the student will be approved by both advisers. Information describing the dual objectives program is available in the Student Personnel Office of the School of Education in Haley Center and in the Office of the Dean of the School in which the student is enrolled.

Students enrolled in the School of Education who desire to complete certification requirements in more than one teaching field will complete the curriculum in each field: pre-professional, teaching specialization and professional teacher education (including the internship).

Applications and specific information about the criteria for selection and admission to Teacher Education are available in the Student Personnel Office in Haley Center, 3084.

Graduate Programs

Graduate programs are offered through the Graduate School in administration and supervision; counselor education; educational media; elementary education; health education; physical education; rehabilitation services; secondary education; special education; and vocational and adult education.

Fifth and sixth-year programs of study in the above areas lead to the degrees of Master of Science, Master of Education, and Specialist in Education. Nondegree graduate study is also available through the Diploma Program leading to sixth-year certification.

The Doctor of Education is offered in Administration and Supervision, Counselor Education, Elementary Education, Secondary Education, and Vocational and Adult Education. Specializations in Secondary Education include the following sub-specializations: (a) English Education, (b) Mathematics Education, (c) Science Education, and (d) Social Science Education. See *Graduate School Bulletin*.

The Master of Education, Master of Science in Education, Specialist in Education and Doctor of Education are offered for junior college administrators, student personnel administrators, and teachers. These programs meet requirements of the Southern Association of Colleges and Schools, the Graduate School, and the School of Education. Sufficient flexibility exists to permit students to adapt programs to their individual needs. Course guides for each of the various programs are available in the Office of the Dean of Education.

Related Programs and Services

Teacher Certification Services

Programs in the School of Education are approved by the National Council for Accreditation of Teacher Education (NCATE) and the Alabama State Board of Education for certifying superintendents, supervisors, principals, counselors, elementary and secondary teachers, and educational media specialists. Upon satisfactory completion of a prescribed course of study and upon recommendation of the Dean of the School of Education a professional certificate will be issued by the appropriate State Department of Education. Twenty-eight State Departments of Education now have reciprocal agreements for issuing certificates to graduates of institutions accredited by NCATE.

Students in schools other than the School of Education who wish to complete requirements for graduation in an academic department and also to complete the degree requirements of the Teacher Education Program may pursue the dual objectives program. (See page 124.) Students may also take courses in education and psychology for acquiring knowledge and understanding of human growth and development, and teaching as a profession. They are eligible to take all such courses for which they satisfy prerequisites.

For detailed requirements for the Professional Certificate (Ranks B, A, or AA), consult the Alabama State Department of Education Bulletin 1966, No. 14, available in the office of the Dean of the School of Education.

Student Personnel Services

This program assists the student in understanding the University and becoming a part of it, in identifying his strengths and limitations, in determining his professional goals, in selecting the proper curriculum in the University, and in securing employment upon graduation.

Recruitment—Efforts of organizations such as the Future Teachers of America in the secondary schools and the Student National Education Association in colleges and of individuals and groups in the profession are aimed at seeking out, informing, and encouraging students, to consider teaching as a profession.

Orientation—The Career Exploration and Planning Program provides University personnel with an understanding of the student's background, individuality, and needs. It assists the student in obtaining information about the University and its programs, in learning more about himself, and in selecting professional goals that are compatible with his abilities. All freshmen in the School of Education and in the dual objectives program participate in this program during their freshman year. Similar attention is provided for transfer students through an orientation and program planning sequence provided by each department.

Counseling—Each Education student is assigned to a faculty adviser who assists the student whenever possible. Other sources of assistance include personnel in the Office of the Dean, classroom teachers, personnel in the Student Development Center, the offices of the Dean of Women, the Dean of Student Affairs, the Registrar, dormitory head residents and counselors, and ministers of local churches. Peer assistance is available through the Student National Education Association (SNEA) located in Haley Center 2002.

The Selective Admission and Retention Program in Teacher Education—In recognition of responsibilities to the schools in which its graduates teach, the School maintains a program of selective admission and retention of candidates for the teaching profession. This program is designed to assure that no candidate is recommended for admission to the Teacher Education Program, the professional internship or certification unless he is deemed competent in his University studies and professional performance.

Application for admission to Teacher Education must be made during the sixth quarter of full-time study in the Pre-Professional Program. Criteria for admission are:

- (1) a grade point average of 1.0 (C) or above on all hours attempted at Auburn University;
- (2) evidence of proficiency in oral and written communication;
- (3) completion of the Pre-Teaching Field Experience Program;
- (4) demonstrated potential for teaching.

In addition, evidence from the following sources may also be used in determining eligibility for admission:

(1) Interviews—Students should be available for interviews upon request of the Student Personnel Service Committee.

(2) Individual Assessment—Students may be requested to take examinations for the purpose of assessing potential for teacher preparation and educational careers.

A student who has been denied admission to Teacher Education must qualify for admission within three quarters or transfer to a more appropriate curriculum.

Any exception to these criteria must be approved by the Dean of the School of Education.

Transfer students with a minimum of 15 quarter hours at Auburn University may apply for admission to Teacher Education.

While retention in the Teacher Education Program is based on the continuous evaluation of the student, a formal evaluation takes place as a prerequisite for admission to the professional internship. At least one quarter prior to the internship the student must submit to the Selective Admission and Retention Committee a formal application for the internship approved by his adviser. Requirements for admission to the professional internship are; (1) admission to the Teacher Education Program; (2) completion of appropriate courses in area of specialization; (3) a grade point average of 1.25 or above on all courses completed in each of the following: professional teacher education, the teaching major, and the teaching minor, and (4) demonstrated potential for teaching.

In order to be eligible for graduation with teacher certification, a student will be expected to complete the requirements identified above and achieve a grade point average of 1.5 in his courses in education and in his teaching major and minor.

Persons with degrees other than in education may make application for study in a curriculum leading to professional certification. Academic background and work experience are evaluated for the purpose of developing the most effective program possible for each student.

Applications and specific information about the criteria of selection for admission to teacher education are available from the Student Personnel Office in Haley Center 3084.

Placement and Follow-up—The Teacher Placement Service provides assistance to prospective teachers in locating desirable positions and assistance to employers in identifying candidates. Persons interested in placement should contact the Student Personnel Office, Haley Center 3084. Follow-up studies of successes, failures, and problems of graduates are made. Further information may be obtained from the Coordinator of Student Personnel Services in Haley Center.

Field Services

Field Services constitute the phase of the work of the School of Education which is designed to make the programs and services of the School available to individuals and off-campus groups for continuous improvement of public education in the State and region. Major categories of services available:

Off-Campus Instruction—This instruction is available through the Field Laboratory Program, enabling teachers in service to complete residence credit toward a graduate degree. The program uses the local school setting as a laboratory in which graduate courses are provided as a framework for solving instructional problems related to various areas of study. The program may be used as a supplement to existing in-service programs or as a basis for developing such programs.

Short courses may also be offered on a non-credit basis for groups interested in specific areas of education and psychology. The courses may consist of a series of lectures or workshops and are available to groups of professional and non-professional personnel interested in short courses in some specific aspect of their work.

Educational Television—Resources and materials of the School of Education are presented to Alabama citizens through the facilities of the Alabama Education Television Network. Telecasts direct and enrich teaching programs for elementary and secondary school students, and assist teachers in their professional career development programs.

Lecture and Consultative Service—The staff of the School of Education is composed of persons who are skilled in general and specific areas of education. The Office of Field Services coordinates the services of these faculty members for lecture and consultative services. These services may be used with in-service education, school and community projects, teacher workshops and institutes, and community clubs and organizations.

School Surveys—School systems desiring comprehensive school surveys or surveys in specific areas of education such as school plant utilization and construction, school finance, administrative organization, and curriculum and teaching programs, may secure services of this type from the School of Education. Surveys may be conducted as separate projects or in conjunction with the Field Laboratory Program described above.

Research Services—School systems may wish to conduct research in such areas as the instructional program, administrative and supervisory patterns and organizations, school and community projects, the development and evaluation of testing programs, and the use of instructional materials and facilities. The assistance of the staff of the School of Education is available for these activities, either as separate endeavors or in conjunction with the instructional and survey services described above.

Correspondence Study—Correspondence study provides undergraduate instruction for persons unable to attend college on a regular basis. Courses parallel to those given on campus are available in English, education, economics, health, physical education and recreation, history, mathematics, psychology, and sociology. Other courses may be added as the demand warrants. All the courses carry college credit. For information concerning the Correspondence Study Program of Auburn University, see page 27 of this Catalog.

Learning Resources Center

The Learning Resources Center (LRC) located in Haley Center is a service component for the School of Education and the School of Arts and Sciences. The LRC provides media services which include filmstrips, transparencies,

disc recordings, tape recordings, kits, educational games, and programs of instruction. LRC personnel assist the faculty and students with the production, selection, and utilization of learning materials.

In-Service Agricultural Education and Supervision

J. C. HOLLIS, *State Supervisor*

ASSISTANT SUPERVISORS HOLLEY, HALCOMB, KILLOUGH, LEWIS, SELLERS, AND
WHITE

In cooperation with the State Department of Education, the School of Education maintains an in-service teacher education and supervisory division. This service extends to 400 departments of vocational agriculture in accredited high schools of the State.

Vocational Rehabilitation Service

F. W. JENKINS, *Supervisor*

CANTRELL, CAUGHRAN, LAMBERT, AND ROBERTS, *Counselors*

The State Department of Education in cooperation with Auburn University maintains the local Rehabilitation Service which provides vocational guidance, counseling, training, and placement services to handicapped citizens. The Rehabilitation Service also makes available to handicapped citizens such services as: surgical and/or medical care, hospitalization, therapeutic treatment, and artificial appliances, when these services are essential to training and/or employment and the individual is not financially able to secure them.



School of Engineering

VINCENT S. HANEMAN, JR., *Dean*
EDWARD O. JONES, *Assistant Dean*

ENGINEERING is a unique program which, in effect, has attempted to provide in a four-year period both a broad general education and a specialized technical education. Although centered around mathematics and the physical sciences, it recognizes the importance of the social sciences, the humanities, and the communication skills. And while the emphasis is upon problem-solving, engineering provides students with the opportunity to integrate their knowledge and to apply it specifically to the problems confronting society—problems such as energy, air and water pollution and urban planning.

Society's needs in the decades ahead will call for engineering talent on a scale never before seen. As a consequence, the opportunities for engineers will be unlimited. All too often, an engineering education is viewed as too specialized, while in actuality, the opposite is true. The basic education that an engineering program affords cannot be overlooked. The following engineering curricula are designed to enable individuals to develop their natural talents and to provide knowledge, skills and understanding that will encourage them to find their place in society.

Programs

Pre-Engineering—The first year (of an integrated four-year program) of course work is administered as the Pre-Engineering Program. This program is designated Pre-Engineering Management (PNM) for students in the management curricula, Pre-Chemical Engineering (PCN) for students in the Chemical Engineering curriculum, and Pre-Engineering (PN) for all other curricula. The uniform Pre-Engineering curriculum is detailed on page 134.

Engineering—Curricula offered are designed to meet the educational requirements of the engineering professions. The program in the fundamental sciences of mathematics, chemistry, and physics is followed by a study of basic engineering sciences. Specialized or departmental courses are taken in the third and fourth years. A parallel program emphasizing the humanistic-social studies is followed throughout the four years. Flexibility is provided in all degree programs through electives and substitutions so that the individual student, with the permission of the head of his major department, may emphasize areas of his own interest.

Curricula accredited by the national accrediting agency, the Engineers' Council for Professional Development, lead to the degrees of Bachelor of Aerospace Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, Materials Engineering, and Mechanical Engineering. An accredited curriculum in Agricultural Engineering is offered by the School of Agriculture.

The Textile Engineering Department administers curricula leading to the degrees of Bachelor of Textile Engineering and Textile Chemistry, which are not accredited by the Engineers' Council for Professional Development.

Management—Two management curricula lead to the degrees of Bachelor of Aviation Management (administered by the Aerospace Engineering Department) and Bachelor of Textile Management (administered by the Textile Engineering Department). These curricula are interdisciplinary in nature and, building upon a broad foundation in mathematics, science, and the humanities, provide selected courses in engineering and business administration to produce graduates trained in technical management.

Dual-Degree—The School of Engineering has joined with a number of other universities in offering a three-two program which results in two college degrees. Agreements have been completed with several other predominantly liberal arts institutions as well as with the School of Arts and Sciences at Auburn.

The first three years would be devoted to earning a major in any one of the areas such as sociology, foreign languages, mathematics, history, political science, or other disciplines offered by that college. Upon completion of three years at the "first college" the student transfers to the School of Engineering where, after approximately two years' study in an engineering curriculum, he or she receives a baccalaureate degree from the "first college" and an Engineering baccalaureate degree from Auburn.

The broad background, which the Dual-Degree Program provides for the two-degree graduate, enables him or her to cope more effectively with many of the problems of modern-day society.

The Dual-Degree Program also contains a provision enabling highly qualified students to obtain a master's degree in Engineering after obtaining a liberal arts undergraduate degree. With this provision, after the student has obtained the liberal arts degree, application may be made to the Graduate School where he or she then pursues the master's degree in one of the Engineering disciplines at Auburn.

For additional information concerning the Dual-Degree Program, contact the Dean of Engineering.

Graduate—Master of Science degrees are offered in Aerospace Engineering, Chemical Engineering, Civil Engineering, Electrical Engineering, Industrial Engineering, and Mechanical Engineering. Three professional degrees, Master of Electrical Engineering, Master of Industrial Engineering, and Master of Mechanical Engineering, are offered. The Doctor of Philosophy degree is offered in Aerospace Engineering, Chemical Engineering, Electrical Engineering, and Mechanical Engineering. For requirements for these degrees, see the *Graduate School Bulletin*.

Admission

Freshmen eligibility will be determined by the Admissions Office. However, since the requirements for engineering education necessitate high school preparatory work of high intellectual quality and of considerable breadth, the following program is recommended as *minimum* preparation: English, four units; mathematics (including algebra, geometry, trigonometry, and analytical geometry), three to four units; chemistry, one unit; history, literature, social science, two or three units. Physics and foreign languages are recommended but not required.

Pre-Engineering Students are transferred to the curriculum of their choice in the School of Engineering after satisfactory performance in the appropriate freshman program. *A student who has not proceeded from Pre-Engineering to his field of major interest in the School of Engineering after the completion of six quarters may continue to register in Pre-Engineering only by special permission of the Dean of Engineering.* Furthermore, Junior standing cannot be granted to any student in the Pre-Engineering Program regardless of the number of hours completed.

Transfers from Other Institutions must apply through the Admissions Office for admission to curricula in the School of Engineering. However, the exact placement of these students can be determined only upon review of their transcripts by the Assistant to the Dean of Engineering. Students will then be placed in the curriculum of their choice if they have completed the requirements given in the preceding paragraph. Otherwise, assignment will be to the appropriate Pre-Engineering curriculum.

Students transferring from junior colleges are allowed credit for equivalent courses taken at the junior colleges, subject to a maximum equal to the number of hours printed in the first two years of their curriculum. The acceptable courses are not, however, limited to the listings within the first two years.

Many courses required by the School of Engineering are highly specialized in their content and potential transfer students need to select courses with care. Therefore, to insure maximum transferability of credits, students are encouraged to contact as soon as possible the Assistant to the Dean of Engineering about acceptable credits.

Humanistic-Social Electives

Engineers must be more than specialists if they are to function effectively in the profession for the benefit of society. They must also be aware of the social and humanistic implications of their activities and be equipped to assume responsibilities in these areas. To assist them in this preparation, degree requirements include approximately 20 quarter-credit hours of humanistic-social studies in addition to the specified courses in English Composition and History. *The University requires at least one course from the area of Humanities and one course from the area of Social Sciences. The courses are either prescribed, elective, or a combination, depending upon the specific engineering curriculum.* Lists of approved electives from the Humanities and from the Social Sciences are available in the offices of the Assistant to the Dean and the Department Heads. Other electives may be approved by the student's Department Head. General areas of acceptable courses follow:

Humanities: Fine Arts, History, Literature, Philosophy and Religion

Social Sciences: Anthropology, Economics, Political Science, Psychology and Sociology.

Additional Information

Military Training—All curricula in the School of Engineering permit the use of some basic and advanced ROTC in lieu of certain electives. For these options, see the specific curriculum.

Service Department—The Technical Services Department is a service department of the School of Engineering, offering courses in graphical methods, industrial laboratories, manufacturing processes, etc. The courses offered in this department may also be taken by students in other schools who may find them useful in their particular fields. The Technical Services Department, in cooperation with the School of Education, offers a program for the professional and technical training of Industrial Arts and Vocational teachers for elementary and secondary schools. (See School of Education for major and minor requirements.)

Cooperative Education Program—The Cooperative Education Program is offered in all curricula of the School of Engineering. Refer to page 27 for a brief description of the program and write to the Director, Cooperative Education, Auburn University, Auburn, Alabama 36830, for a booklet which gives additional information.

Engineering Extension Service—The Engineering Extension Service helps to extend the resources of the School of Engineering to the people, businesses, and industries of the state. Most of the programs of this expanding service are short courses, conferences, clinics, and seminars. For further information, write to the Assistant Director, Engineering Extension Service, 107 Ramsay Hall.

Pre-Engineering

The Pre-Engineering Program consists of a freshman program of studies to prepare students for curricula in the School of Engineering. It also provides academic and career counseling to assist students in determining the curriculum that best fulfills their personal and educational objectives.

The Pre-Engineering curriculum shown below is uniform for seven engineering curricula: Aerospace, Civil, Electrical, Industrial, Materials, Mechanical, and Textile Engineering. Therefore, a student is not required to designate his curriculum choice prior to the completion of the Pre-Engineering curriculum. The curricula of Aviation Management, Chemical Engineering, Textile Chemistry, and Textile Management have separate freshman year requirements.

Pre-Engineering Curriculum

FRESHMAN YEAR			
First Quarter		Second Quarter	
MH 161	An. Geom. & Cal. ....5	MH 162	An. Geom. & Cal. ....5
CH 103	Fnds. of Chem. I** ....4	CH 104	Fnds. of Chem. II ....4
EH 101	English Comp. ....3	EH 102	English Comp. ....3
EGR 100	Engineering	TS 102	Graph. Communica-
	Perspectives† .....2		tion & Design .....2
CH 103L	Gen. Chem. Lab. ....1	CH 104L	Gen. Chem. Lab. ....1
PE	Basic ROTC or Elect. ....1	CH 104L	Basic ROTC or Elect. ....1
	Physical Education ....1	PE	Physical Education ....1
		Third Quarter	
MH 163	An. Geom. & Cal. ....5	MH 163	An. Geom. & Cal. ....5
PS 220	Gen. Physics I. ....4	PS 220	Gen. Physics I. ....4
EH 103	English Comp. ....3	EH 103	English Comp. ....3
HY 101	World History or	HY 101	World History or
	Tech. & Civiliz. ....3		Tech. & Civiliz. ....3
HY 204	Basic ROTC or Elect. ....1	HY 204	Basic ROTC or Elect. ....1
PE	Physical Education ....1	PE	Physical Education ....1

*Students whose combined ACT scores of English and Mathematics are lower than 50, or whose total SAT scores are less than 1100 are enrolled in Mathematics 160 for no credit.

**Student whose composite ACT scores are lower than 25, or whose total SAT scores are less than 1130 are enrolled in Chemistry 101, followed by Chemistry 102 and Chemistry 103 Laboratory, followed by Chemistry 104 with Chemistry 104 Laboratory.

†Not required for transfer students.

Department of Aerospace Engineering

The Aerospace Engineering curriculum provides a background for students entering many areas of today's scientific and technological fields. The first two years of study are devoted to the basic subjects of mathematics, physics, and mechanics. The last two years deal with such areas as aerodynamics, design, astrodynamics, propulsion, structures, and flight dynamics. In support of these areas, courses in advanced mathematics, computer programming (both digital and analog), and systems analysis are offered. The methods of systematic problem analysis are stressed. The theory learned in classroom lectures is experimentally verified in laboratory sessions. During the senior year students may take technical electives in several fields of specialization. The Aerospace Engineering Curriculum also serves as a background for graduate study and research.

Curriculum in Aerospace Engineering (AE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 134)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	ME 321	Dynamics I	4	ME 301	Thermo. I	4
ME 205	Applied Mech.	3	PS 222	General Physics III	4	AE 300	Aero. An. I	3
	Statics	4	MH 265	Diff. Equat.	3	EE 261	Linear Circuit	3
PS 221	Gen. Physics II	4	HY 102	World History†	3		Analysis I	3
AE 203	Aerospace Fund.	3		Hum. Soc. Elect.*	3	ME 207	Strength of	3
	Basic ROTC or Elect.	1		Basic ROTC or Elect.	1		Mat. I	3
						HY 103	World History†	3
							Basic ROTC or Elect.	1

JUNIOR YEAR

AE 307	Aero. Struct. I	5	AE 302	Airloads	4	AE 409	Aero. Struct. II	5
AE 310	Aero. An. II	4	AE 303	Theor. Aero. I	4	AE 515	Jet Propulsion	5
AE 330	Aero. Instr.	3	PS 320	Modern Physics	3	AE 304	Theor. Aero. II	4
ME 340	Fluid Mech. I	3	AE 311	Aero. Mat. & Methods of Construct.	2	AE 326	Fund. of Aero-space Dynamics	3
	Hum.-Soc. Elect.*	3		Hum.-Soc. Elect.*	3			

SENIOR YEAR

AE 439	Static Stab. & Control	4	AE 500	Viscous Aero.	4	AE 529	Aircraft Vibration and Flutter	4
AE 534	Aero. Sys. Anal.	3	AE 532	Astrodynamics I	3	AE 533	Astrodynam. II	3
AE 305	Flight Perform.	3	AE 541	Dyn. Stab. & Cont.	3	AE 449	Aero. Design II	1
AE 401	Aero. Prob. I	1	AE 448	Aero. Design I	1	AE 402	Aero. Prob. II	1
	Tech. Elective	3		Tech. Elective	3		Technical Elective	6
	Hum.-Soc. Elect.*	5		Hum.-Soc. Elect.*	3		Hum.-Soc. Elect.*	3

TOTAL—208 QUARTER HOURS

†Recommended approved alternate sequence HY 205-206.

*See page 133 for the selection of Humanistic-Social Electives. Six hours of Advanced ROTC may be substituted for six hours of Humanistic-Social Electives.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

AE 427	Engineering Meteorology	3	EE 263	Linear Circuit Analysis II	4
AE 450	Dynamic Meteorology I	3	EE 264	Linear Circuit Analysis II, Laboratory	1
AE 451	Dynamic Meteorology II	3	EE 371	Electronics I	3
AE 491	Special Problems	1-5	EE 382	Electromechanical Energy Conversion I	3
AE 514	Equilibrium Gas Dynamics	3	IE 410	Probability and Statistics	5
AE 516	Rocket Propulsion I	3	ME 303	Thermodynamics III	3
AE 517	Rocket Propulsion II	3	ME 501	Statistical Thermodynamics	3
AE 520	Dynamic Simulation	3	ME 521	Heat Transfer	4
AE 521	Flight Vehicle Stress Analysis	3	ME 522	Transport Phenomena	3
AE 524	Nonequilibrium Gas Dynamics	3	ME 543	Photoelastic Stress and Strain Analysis	3
AE 528	Space Propulsion Systems	5	MH 503	Engineering Mathematics II	5
AE 535	Elements of V/STOL Flight	3	MH 506	Elementary Partial Differential Equations	5
AE 536	Rotary Wing Aerodynamics	3	MH 560	Introduction to Numerical Analysis	5
AE 542	Automatic Stability and Control	3	MH 561	Numerical Matrix Analysis	5
AE 545	Missile Aerodynamics	3	PS 505	Nuclear Physics	5
CE 524	Air Pollution	5			
CHE 540	Nuclear Engineering	5			

Aviation Management

The curriculum in Aviation Management provides education for management careers with the airlines, general aviation, manufacturing, governmental agencies or the military services. The study of fundamental aerospace courses is combined with specified subjects in industrial engineering, business management and selected electives to provide preparation for the various specific functions of the aerospace industries including general management, production, operations, flying, maintenance, and education and training. Laboratory experience in aviation management and flight is provided through the university owned and operated airport in which students are given the opportunity to participate in administration, training and aircraft maintenance and servicing. The Aviation Management curriculum also provides a broad educational background of fundamental philosophies, theories, and concepts needed for research and study at the graduate levels.

Curriculum in Aviation Management (AM)

FRESHMAN YEAR		
First Quarter		
MH 160	Pre-Cal. W. Trig.....	5
EH 101	English Comp.....	3
HY 101	World History or	
HY 204	Tech. & Civiliz. I.....	3
TS 100	Intr. to Mfg. Proc.....	2
TS 102	Engr. Drawing.....	2
PE	Physical Education.....	1
Second Quarter		
MH 161	An. Geom. & Cal.....	5
EH 102	English Comp.....	3
HY 102	World History or	
HY 205	Tech. & Civiliz. II.....	3
TS 107	Graphical Anal. and	
	Design.....	2
	Basic Shop Elective.....	1
PE	Physical Education.....	1
Third Quarter		
AM 200	Aerospace Problems	
	Analysis.....	5
EH 103	English Comp.....	3
HY 103	World History or	
HY 206	Tech. & Civiliz. III.....	3
	Hum.-Soc. Elective.....	3
TS 108	Design for Mgt.....	2
PE	Physical Education.....	1
SOPHOMORE YEAR		
AM 201	Elem. Aeronaut.....	5
EC 200	Economics I.....	5
PS 205	Intr. Physics.....	5
IE 201	Indus. Admin.....	3
EC 274	Bus. & Econ	
	Statistics.....	5
PG 211	Psychology I.....	5
PS 206	Intr. Physics.....	5
AM 202	Aerospace History.....	3
ACF 215	Fund. Gen. & Cost	
	Accounting.....	5
PO 209	Intr. to Am. Gov't.....	5
AE 203	Aerospace Fund. or	
IE 204	Computer Program.....	3
AM 309	Reciprocating Engr. &	
	Prop. Principles.....	3
	Hum.-Soc. Elective.....	3
JUNIOR YEAR		
MN 241	Business Law.....	4
SC 211	Fund. Sp. Comm.....	5
AM 314	Aero. Mgt. and	
	Oper. Problems (3) or	
IE 316	Electronic Data	
	Processing Sys.....	4
AM 310	Jet Propulsion.....	3
AM 312	Guidance & Control	
	Fund.....	5
IE 320	Engr. Economy.....	5
IE 310	Motion & Time	
	Study.....	5
EH 304	Tech. Writing.....	3
AM 305	Aviation Meteorology.....	5
AM 313	Aerospace Veh. Sys.....	5
MT 472	Econ. Transport.....	5
IE 302	Prod. Control Tech.....	3
SENIOR YEAR		
AM 407	Air Transport.....	5
MN 346	Human Rel. in Mgt.....	5
AM 403	Gen. Avn. Mgt.....	3
	Technical Electives.....	6
AM 409	Aerospace Legisla-	
	tion.....	3
AM 413	Airport Mgt.....	3
MN 442	Personnel Mgt.....	5
AM or	AE Elective.....	3
	Technical Elective.....	4
AM 417	Airline Oper.....	5
AM or	AE Elective.....	3
AM 401	Aeronautical Sem.....	1
	Technical Electives.....	6

TOTAL—207 QUARTER HOURS

Twelve hours of ROTC (Basic 6; Advanced, 6) may be substituted for 5 hours of Humanistic—Social Electives, SC 211 (five hours) and 1 hour of technical electives.

See page 133 for the selection of Humanistic—Social Electives. Technical Electives must be approved by the Department Head.

Basic Shop electives may include TS 112, 113, 114, 115, or 216. If TS 216 is used, the additional hour may be used as a Technical Elective.

*If AM 314 is scheduled, one additional hour of Technical Elective must be taken.

Option in Professional Flight

This option develops competency in flight to prepare the student for a professional career in flight operations, to include such positions as a flight officer with the airlines, a corporate pilot or a flight instructor. Aviation Management students may qualify for this option by completing as a minimum, the following courses:

AM 215	Principles of Private Flight—Ground	3
AM 216	Completion of Private Flight—Ground	3
AM 217	Introduction to Flight Training*	1
AM 218	Private Pilot Flight Training*	1
AM 321	Commercial Flight Problems	1
AM 322	Commercial Flight Training I*	1
AM 323	Aircraft Operations and Performance	3
AM 324	Commercial Flight Training II*	1
AM 325	Principles of Instrument Flight	3
AM 326	Commercial Flight Training III*	1
AM 327	Commercial Flight Training IV*	1
AM 404	General Aviation Operations	3
AM 432	Principles of Professional Flight and	3
AM 427	Multi-Engine Flight Training I*	1
AM 431	Multi-Engine Flight Training II	1
AM 433	Transport Aircraft Flight Training* or	2
AM 428	Principles of Flight Instruction	3
AM 429	Flight Instructor Training*	1

*A separate flight instruction fee is applicable to this course.

Department of Chemical Engineering

The program leading to the bachelor's degree in chemical engineering consists almost entirely of the study of broad scientific and engineering principles, which have numerous applications in the chemical and related industries. The student may select a major interest area during his junior year. These include process engineering, nuclear engineering, biochemical engineering, environmental engineering, engineering science, and production management. Technical electives may be selected in all of these and other areas on an individual basis. Those students who elect to continue their education through one or more advanced degrees are qualified for better positions and often make more rapid progress than those with only the bachelor's degree.

The broad university training provided, when supplemented by professional experience, enables graduates to qualify for positions as engineers in production, research and development, sales engineering, plant design and management.

The curriculum in chemical engineering is offered under both the regular and the cooperative plan. See the Cooperative Education program on page 27.

Curriculum in Chemical Engineering (CHE)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	Gen. Chemistry	5	CH 112	Gen. Chemistry	5	CH 113	Gen. Chemistry	5
MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5	MH 163	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
TS 102	Graphic Methods	2	HY 101	World History*	3	HY 102	World History*	3
CHE 101	Chem. Engr. Fund.	1	PE	Physical Education	1	PE	Physical Education	1
PE	Physical Education	1						

SOPHOMORE YEAR

MH 264	An. Geom. & Cal.	5	CH 303	Organic Chemistry	5	CH 304	Organic Chemistry	5
PS 220	Gen. Physics	4	PS 221	Gen. Physics II	4	PS 222	Gen. Physics	4
HY 103	World History*	3	CE 205	Engr. Mech. Statics	4	CE 207	Mech. of Solids	3
	Hum.-Soc. Elect.*	5	MH 265	Diff. Equations	3		Hum.-Soc. Elect.*	5
			CHE 213	Comp. in CHE	2			

First Quarter			JUNIOR YEAR			Third Quarter		
CH 507	Phys. Chemistry	5	CH 508	Phys. Chemistry	5	CHE 313	CHE Analysis	4
EE 300	Fund. Elec. Eng.	5	CHE 332	Thermo. I.	4	CHE 353	Heat Transfer	4
CHE 321	Proc. Prin.	4	CHE 352	Fluid Mechanics	4	CHE 343	Stagewise Proc.	4
CHE 331	Engr. Thermo.	3		Tech. Elective***	3		Hum.-Soc. Elect.**	5
				Hum.-Soc. Elect**	3			
Second Quarter			SENIOR YEAR					
CHE 511	Proc. Cont.	5	CHE 582	CHE Lab.	6	CHE 543	CHE Design II	6
CHE 521	Thermo. II	4	CHE 542	CHE Design I	4		Tech. Elective***	10
CHE 551	Mass Transfer	4	CHE 522	Chem. React. Eng.	4		Hum.-Soc. Elect.**	2
	Tech. Elective***	5		Tech. Elective***	3	CHE 470	Seminar	1

TOTAL—210 QUARTER HOURS

*May be taken in any sequence. Approved alternate sequence HY 204-205-206.

**See page 133 for the selection of Humanistic-Social Electives. Six hours of Basic ROTC may be substituted for six hours of Humanistic-Social Electives. Three hours of Advanced ROTC may be substituted for three hours of Technical Electives.

***Technical electives shown above total 21 hours. They may be taken in one of the following six areas. Typical courses in each area from which the 21 hours may be selected with the consent of faculty adviser are listed below.

†Students not prepared for MH 161 must take MH 160 without credit.

TECHNICAL ELECTIVES

Process Engineering			Biochemical Engineering			Nuclear Engineering		
CH 513	Anal. Chem.	5	BI 101	Prin. of Biology	5	CHE 450	Spec. Topics in	
CH 515	Polymer Tech.	5	BY 300	Gen. Microb. I.	5		CHE	TBA
CHE 450	Spec. Topics in		BY 501	Bio. Statistics	5	CHE 540	Nuclear Engr.	6
	CHE	TBA	BY 542	Gen. Virology	5	EE 371	Electronics I.	3
CHE 540	Nuclear Engr.	5	CH 518	Biochemistry	5	ME 335	Phys. Metallurgy	4
CHE 560	Intr. to Plast.	3	CH 519	Biochemistry	5	ME 514	Turbo Machines	4
CHE 565	Ind. Waste Water		CH 520	Biochemistry	5	PS 305	Intr. to Mod. Phys.	5
	Treatment	4	CHE 450	Spec. topics in		PS 320	Mod. Phys. for Engr.	3
CHE 585	Air Qual. Engr.	5		CHE	TBA	PS 505	Nuclear Physics	5
EE 371	Electronics I.	3	CHE 595	Biochemical Engr.	3	PS 517	Intr. to Biophysics	5
IE 410	Engr. Statistics	5	ZY 105	Human Physiology	5	PS 570	Health Physics	5
ME 536	Ferrous Metal	3						
Environmental Engineering			Engineering Science			Production Management		
BI 101	Prin. of Biology	5	CH 509	Phys. Chemistry	5	ACF 215	Fund. of Gen. &	
BY 300	Gen. Microb. I.	5	CHE 450	Spec. topics in			Cost Accounting	5
BY 541	Sanitary Microb.	5		CHE	TBA	ACF 361	Prin. of Bus. Fin.	5
CE 305	Water Supply &		CHE 513	Anal. Chemistry	5	CHE 450	Spec. Topics in	
	Disposal Systems	4	IE 410	Engr. Statistics	5		CHE	TBA
CE 509	Envir. Hlth. Engr.	5	ME 341	Fluid Mech. II.	3	IE 201	Ind. Admin.	3
CE 524	Air Pollution	3	MH 266	Topics in Linear		IE 302	Prod. Cont. Tech.	3
CH 305	Organic Chemistry	5		Algebra	3	IE 410	Engr. Statistics	5
CH 513	Anal. Chemistry	5	MH 382	Engr. Math I.	3	MN 310	Prin. of Mgt.	5
CHE 450	Spec. topics in		MH 501	Cal. of Vector		MN 346	Hum. Rel. in Mgt.	5
	CHE	TBA		Functions	3	MN 355	Legal Envir. of Bus.	5
CHE 565	Ind. Waste Water		MH 503	Engr. Math. II.	5	MT 331	Prin. of Marketing	5
	Treatment	4	MH 505	Matrix Th. & Appl.	5	MT 572	Econ. of Transp.	5
CHE 585	Air Qual. Engr.	4	PS 320	Modern Physics	3			

Department of Civil Engineering

The Civil Engineering curriculum provides a background in mathematics and the physical sciences, in humanistic-social studies, and in the engineering sciences and the interrelated subdisciplines of civil engineering. Technical electives permit the undergraduate limited specialization in an area of civil engineering such as construction, environmental engineering, soils, structures, transportation, or water resources.

The civil engineer plays an essential role in the realization of some of the most basic goals, objectives, and needs of society. These relate to man's need for shelter, mobility, water, air, and productive land—the environment in which he lives and works.

Curriculum in Civil Engineering (CE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 134)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	EC 200	Economics	5	CE 201	Surveying	5
CE 205	Engineering Mech. Statics	4	PS 222	General Physics III	4	CE 301	Civil Engineering Analysis	5
PS 221	General Physics II	4	MH 265	Diff. Equations	3	CE 207	Mechanics of Solids	3
HY 102	World History*	3	HY 103	World History*	3		Hum.-Soc. Elect.**	3
	Basic ROTC or Elect.	1	CE 202	Intr. to Computer Methods in Civil Engineering	3		Basic ROTC or Elect.	1
				Basic ROTC or Elect.	1			

JUNIOR YEAR

CE 320	Fund. of Transp. Engr.	5	CE 304	Theo. of Struc. I	5	CE 380	Theo. of Struc. II	5
IE 320	Engineering Econ.	5	IE 410	Engr. Statistics	5	CE 308	Hydraulics	5
ME 321	Dynamics I	4	CE 315	Engineering Geology	4	CE 406	Intr. to Soil Mechanics	5
CHE 331	Engineering Thermodynamics	3	CHE 352	Fluid Mechanics	4	PS 320	Modern Physics for Engineers	3

SENIOR YEAR

CE 404	Structural Analysis	4	CE 405	Water & Waste Water Treatment	5	CE	Design Elective†	5
CE 305	Water Supply & Disposal	5	CE 417	Soil & Foundation Engr.	3		Tech. Elective	8
EE 300	Fund. of Electrical Engr.	5		Tech. Elective	3		Hum.-Soc. Elective**	3
	Tech. Elective	3		Hum.-Soc. Elective**	6			
	Hum.-Soc. Elective**	3						

TOTAL—210 QUARTER HOURS

*Recommended approved alternate sequence HY 205-206.

**See page — for the selection of Humanities-Social Electives. Six hours of Advanced ROTC may be substituted for six hours of Humanities-Social Electives.

†Design elective must be selected from the approved list.

TECHNICAL ELECTIVES

A list of suggested technical electives may be obtained in the departmental office. Any selection not on the list must be approved by the Head of the Department.

Department of Electrical Engineering

The Electrical Engineering curriculum is organized around six basic areas of study. They are Circuit Analysis, Electronics and Communications, Energy Conversion and Transmission, Electromagnetic Fields, Automatic Control, and Computer Engineering. In addition, technical electives in the senior year provide flexibility in the curriculum to accommodate the diversity of interests and talents among the students. A student, through his choice of technical electives, can concentrate on a topic of individual interest or choose a combination of electives from different areas to maintain a broad program. Electives relevant to each of the specialized topics in Electrical Engineering, along with additional courses which are related to these topics, are grouped on an approved list available from the Electrical Engineering Department.

Curriculum in Electrical Engineering (EE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 134)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	ME 205	Statics	4	EE 263	Circuit Analysis II	4
PS 221	Gen. Physics II	4	PS 222	Gen. Physics III	4	ME 321	Dynamics I	4
HY 102	World History†	3	MH 265	Linear Diff. Equa.	3	MH 266	Linear Algebra	3
ME 202	Engr. Materials	3	EE 261	Circuit Analysis I	3	PS 320	Mod. Phy. for Engr.	3
EE 201	Intr. to EE	3	HY 103	World History†	3	EE 264	Lin. Cir. Anal. II Lab.	1
	Basic ROTC or Elec.	1		Basic ROTC or Elec.	1		Hum.-Soc. Elective*	3
							Basic ROTC or Elec.	1

JUNIOR YEAR					
First Quarter			Second Quarter		Third Quarter
EE 362	Linear Systems.....	6	EE 351	Linear Fdbk. Sys.....	5
EE 391	Electromag. I.....	4	EE 322	Logic Circuits.....	3
ME 301	Thermodynamics I.....	4	EE 371	Electronics I.....	3
	Hum.-Soc. Elective*.....	3	EE 392	Electromag. II.....	3
				Hum.-Soc. Elective*.....	3

TOTAL—210 QUARTER HOURS

†Recommended approved alternate sequence: HY 205-206.

*Hum.-Soc. Studies selected from approved lists.

**Selected from an approved list which can be obtained from the Electrical Engineering Department office. Six hours advanced ROTC may be substituted.

Computer Science And Engineering

The School of Engineering gives instruction in Computer Science and Computer Engineering to provide elective courses for Engineering, Arts and Sciences, and Business students who want to specialize in Computer Science or Computer Engineering.

Computer Science is the study of representation and transformations of information structures, programming languages, computational models, computer design and organization, translators, information processing systems, numerical mathematics, data processing, simulation, and information retrieval. Emphasis is placed on software and programming.

Computer Engineering is the study of digital computer organization, design, utilization, programming languages and translators, information processing systems, and system performance. Emphasis is placed on digital hardware design and utilization.

For those students who wish to channel their studies toward digital computation and computing machinery, the following lists of electives are available from the indicated departments:

COMPUTER SCIENCE COURSES

EE 202	Timesharing and Terminal Systems.....2	EE 520	Fund. of Computer Graphics Systems.....4
IE 202	Industrial Engineering Fundamentals.....3	EE 521	Introduction to Artificial Intelligence and Robotics.....4
IE 204	Computer Programming.....3	EE 526	Minicomputer Laboratory.....1
IE 300	Computer Programming and Introduction to Information Decision System.....3	EE 527	Systems Prog. and Operating Systems.....3
IE 301	Information Retrieval and Computer Programming.....3	EE 528	Compiler Construction.....3
IE 316	Electronic Data Processing Systems Design.....4	EE 555	Advanced Computer Programming.....3
EE 322	Combinational Logic Circuits.....3	IE 556	Simscript.....3
EE 324	Sequential Machines.....3	MH 560	Introduction to Numerical Analysis.....5
EE 384	Data Structures.....3	MH 561	Numerical Matrix Analysis.....5
IE 385	Computer Programming Systems I.....3	IE 585	Computer Programming Systems II.....1
IE 416	Simulation.....3	IE 586	Information Organization and Retrieval.....3
EE 425	Minicomputer Organization.....4	IE 587	Formal Theory of Computer Languages I.....3
		IE 588	Fundamental Algorithms.....3

COMPUTER ENGINEERING COURSES

EE 202	Timesharing and Terminal Systems.....	2	EE 521	Introduction to Artificial Intelligence and Robotics.....	4
IE 202	Industrial Engineering Fundamentals.....	3	EE 522	Digital Subsystems.....	4
IE 204	Computer Programming.....	3	EE 523	Fault-Diagnosis of Digital Systems.....	3
IE 301	Information Retrieval and Computer Programming.....	3	EE 524	Microcomputers.....	4
IE 316	Electronic Data Processing Systems Design.....	3	EE 526	Minicomputer Laboratory.....	1
EE 322	Combinational Logic Circuits.....	3	EE 527	Systems Programming and Operating Systems.....	3
EE 324	Sequential Machines.....	3	EE 529	Computer Projects Laboratory.....	TBA
IE 384	Data Structures.....	3	EE 551	Hybrid Computation.....	5
IE 385	Computer Programming Systems I.....	3	IE 555	Advanced Computer Programming.....	3
EE 425	Minicomputer Organization.....	4	MH 560	Introduction to Numerical Analysis.....	5
EE 520	Fundamentals of Computer Graphics.....	4	MH 561	Numerical Matrix Analysis.....	5
			IE 585	Computer Programming Systems II.....	3

Department of Industrial Engineering

Industrial Engineering differs from other branches of the engineering profession in three basic ways. First, it covers all types of industrial, commercial, and service activity. Second, it gives substantial emphasis to the role of people as well as machines and materials in systems design. Third, it becomes heavily involved in the economic and financial aspects of the problems it considers. While the Industrial Engineer is still concerned with production systems, many non-industrial organizations have recognized the value of Industrial Engineering techniques, and Industrial Engineers are practicing in health, marketing, financial, governmental, military, transportation, educational, agricultural, and consulting organizations. Furthermore, they have increasingly become involved in interdisciplinary activities.

The Industrial Engineering curriculum emphasizes the systems approach to design, operation, and control, and provides the student with competencies in quantitative and qualitative analysis and solution procedures to the resource utilization, data processing, information flow, management, economic, and human factors problems associated with almost any system. The curriculum includes departmental courses in the areas of: computer systems and programming, simulation, mathematical optimization methods, probability and statistics, operation research, production processes, facilities design, human performance, and the design of man's work environment and work methods. An elective program equivalent to approximately two quarter's course work permits the student to pursue further topics of personal and professional interest.

A wide variety of employment opportunities is available to the Industrial Engineer since his competencies are required by almost all manufacturing and service organizations. Additionally, Industrial Engineering is excellent training for top management positions.

Options in occupational safety and health and computer science are available to the student wishing to specialize in these important areas of Industrial Engineering practice.

Curriculum in Industrial Engineering (IE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 134)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
IE 202	Ind. Engr. Fund.....	3	IE 300	Computer Prog.....	3	IE 311	Statistics I.....	3
MH 264	An. Geom. & Cal.....	5	MH 265	Diff. Equations.....	3	IE 327	Engr. Econ. Anal.....	5
PG 211	Gen. Psychology.....	5	EC 200	Economics I.....	5	HY 103	World History I.....	3
PS 221	Gen. Physics II.....	4	PS 222	Gen. Physics III.....	4	PS 320	Modern Physics.....	3
	ROTC or Elective.....	1	HY 102	World History I.....	3		ROTC or Elective.....	1
				ROTC or Elective.....	1		Hum.-Soc. Elec.....	3

JUNIOR YEAR											
First Quarter				Second Quarter				Third Quarter			
IE	323	Engr. Stat. II.....	5	IE	308	Ergonomics I.....	4	IE	408	Ergonomics II.....	5
IE	305	Info-Dec. Sys.....	3	IE	333	Engr. Stat III.....	4	IE	415	Oper. Research	
PG	321	Exp. Psych II.....		IE	335	Linear Prog.....	4			Models.....	5
		Perception.....	4	EE	261	Linear Circuits		EE	263	Lin. Circuits	
ME	301	Thermodynamics I.....	4			Analysis I.....	3			Analysis II.....	4
		Hum.-Soc. Elective.....	3			Tech. Elective.....	3			Tech. Elective.....	3
SENIOR YEAR											
IE	416	Simulation.....	3	IE	425	Prod. Cont.		IE	428	Oper. & Fac.	
IE	422	Prod. Cont.				Func. II.....	3			Des. II.....	3
		Func. I.....	4	IE	427	Oper & Fac. Des. I.....	3	ME	321	Dynamics.....	4
ME	205	Statics.....	4	ME	207	Stren. of Mat. I.....	3			Free Elective.....	5
		Tech. Elective.....	5			Tech. Elective.....	6			Tech. Elective.....	3
TOTAL—206 QUARTER HOURS											

TOTAL—206 QUARTER HOURS

†Recommended approved alternate sequence: HY 205-206.

SUGGESTED ELECTIVES

A pamphlet describing the student's elective options and suggested courses is available in the IE department offices. Elective courses are available in all fields of engineering represented on campus, computer science, operations research, statistics, production analysis, management economics, psychology and human performance, mathematics, environmental quality, and ecology. Six hours of advanced ROTC may be substituted for six hours of humanistic or free electives.

Computer Science Option

Freshman and Sophomore years same as in Industrial Engineering Curriculum

JUNIOR YEAR											
First Quarter				Second Quarter				Third Quarter			
IE	323	Engr. Stat. II.....	5	IE	308	Ergonomics I.....	4	IE	408	Ergonomics II.....	5
IE	305	Info-Dec. Sys.....	3	IE	333	Engr. Stat III.....	4	IE	415	Oper. Research	
PG	321	Exp. Psych II.....		IE	335	Linear Prog.....	4			Models.....	5
		Perception.....	4	IE	384	Data Structures.....	3	IE	385	Comp. Prog.	
ME	301	Thermodynamics I.....	4	EE	261	Linear Circuits				Sys. I.....	3
		Hum.-Soc. Elective.....	3			Analysis I.....	3	EE	263	Linear Circuits	
SENIOR YEAR											
IE	416	Simulation.....	3	IE	425	Prod. Cont.		IE	428	Oper. & Fac.	
IE	422	Prod. Cont.				Func. II.....	3			Des. II.....	3
		Func. I.....	4	IE	427	Oper. & Fac. Des. I.....	3	ME	321	Dynamics.....	4
ME	205	Statics.....	4	ME	207	Stren. of Mat. I.....	3			Computer Science	
MH	560	Intr. Num. Anal.....	5	EE	322	Comb. Logic Cir.....	3			Elective.....	8*
						Computer Science					
						Elective.....	3*				

TOTAL—206 QUARTER HOURS

*These hours must come from the following two groups of courses with at least one course from each group: (1) IE 301, IE 555, IE 585, (2) IE 553, IE 586, MH 331, MH 405, MH 561.

Occupational Safety Option

Freshman and Sophomore years same as in Industrial Engineering Curriculum

First Quarter				JUNIOR YEAR				Third Quarter			
IE	323	Engr. Stat. II.....	5	IE	308	Ergonomics I.....	4	IE	408	Ergonomics II.....	5
IE	305	Info-Des. Sys.....	3	IE	333	Engr. Stat III.....	4	IE	415	Oper. Research	
PG	321	Exp. Psych II.....		IE	335	Linear Prog.....	4			Models.....	5
		Perception.....	4	IE	401	Occup. Safety		IE	402	Sys. Anal for	
ME	301	Thermodynamics I.....	4			Fund.....	3			Occup. Sfty.....	3
		Hum.-Soc. Elective.....	3	EE	261	Linear Circuits		EE	263	Lin. Circuits	
						Analysis I.....	3			Analysis II.....	4
SENIOR YEAR											
IE	416	Simulation.....	3	IE	425	Prod. Cont.		IE	428	Oper. & Fac.	
IE	422	Prod. Cont.				Func. II.....	3			Des. II.....	3
		Func. I.....	4	IE	427	Oper. & Fac.		IE	406	Occup. Sfty. Lab.....	3
IE	403	Occup. Acc. Prev.....	3			Des. I.....	3	ME	321	Dynamics.....	4
IE	404	Occup. Hyg. Engr. I.....	3	IE	405	Occup. Hyg.		ME	444	Design Hzd. Reduction	4
ME	205	Statics.....	4			Engr. II.....	3				
				ME	207	Stren. of Mat. I.....	3				
				EE	397	Intr. Acoustics.....	3				

TOTAL—206 QUARTER HOURS

Department of Mechanical Engineering

The curriculum provides the student with a strong background in mathematics and the physical sciences. The basic engineering science fields of engineering mechanics, materials science, thermodynamics, fluid mechanics, and heat and mass transfer are covered in depth to give students understanding and the ability to solve problems in these areas. In addition, there are professional subjects offering instruction in combustion engines, including gas turbines and rockets, power plants, air conditioning, refrigeration, automatic controls, turbomachinery and machine design. A series of courses in electrical subjects is also included to equip the graduate with needed fundamental knowledge in this rapidly expanding field.

Modern design courses at senior level, employing both the group project and the individual project techniques, provide an opportunity for the student to solve typical engineering problems, requiring the development of skill and cooperation in creative design, analysis, and synthesis.

Humanistic-social subjects are required to give the student breadth and to add to his general education.

Technical electives are provided in the senior year of the curriculum to enable students to specialize to a limited extent, including a sequence in optimization theory.

Curriculum in Mechanical Engineering (ME)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 134)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	PS 222	General Physics III	4	ME 301	Thermodynamics I	4
PS 221	General Physics II	4	ME 202	Engr. Materials		ME 321	Dynamics I	4
ME 205	Applied Mechanics-Statics	4		Science-Structure	3	EE 261	Linear Circuit Analysis I	3
HY 102	World History or		ME 207	Strength of Matis. I	3	MH 362	Engr. Math. I	3
HY 205	Tech. and Civiliz.	3	HY 206	Tech. and Civiliz.	3	ME 309	Correlative Experimental Mechanics	2
	Basic ROTC or Elective1		MH 265	Linear Diff. Equat.	3		Basic ROTC or Elective1	
			ME 211	Engr. Methods	2			
				Basic ROTC or Elective1				

JUNIOR YEAR

ME 322	Dynamics II	4	ME 323	Dynamics of Machs	4	ME 335	Engr. Materials	
ME 316	Strength of Matis. II	4	ME 304	Engr. Materials			Science-Metallurgy	4
ME 308	Computations Lab.	3		Science-Properties	3	ME 341	Fluid Mech. II	4
EE 263	Linear Cir. Analy. II	4	ME 302	Thermodynamics II	3	ME 303	Thermodynamics III	3
SC 202	App. Sp. Comm. I or		ME 340	Fluid Mechanics I	3	PS 320	Modern Phy. for Engr.	3
EH 304	Tech. Writing†	3		Electrical Science Elective**	3		Hum.-Soc. Elect.*	3

SENIOR YEAR

ME 521	Heat Transfer	4	ME 515	Thermodynamics of Power Systems	4	ME 451	Advanced Projects	3
ME 439	Mech. Engr. Design I	4	ME 440	Mech. Engr. Design II	3	ME 420	Thermal Systems Laboratory	2
ME 527	Dynamics of Physical Systems	4	ME 522	Transport Processes	3		Hum.-Soc. Elective*	9
	Hum.-Soc. Elective*	3	ME 412	Measurements Lab.	3		Technical Elective	4
	Technical Elective	3		Hum.-Soc. Elective*	3			
				Technical Elective	3			

TOTAL—210 QUARTER HOURS

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) or EH 304 (3 hrs.) and three additional hours approved by the Department Head.

*See page 133 for the selection of Humanistic-Social Electives.

**Electrical Science Elective must be EE 301 Engineering Instrumentation or EE 371 Electronics I or EE 382 Electromechanical Energy Conversion I.

NOTE: The recommended technical elective sequence in optimization theory is MH 310 and ME 502. Additional courses following this sequence are available.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department and the Dean of Engineering.

AE 302	Airloads	4	TS 550	Engineering Metrology	1-5
AE 427	Engineering Meteorology	3	ME 501	Statistical Thermodynamics	3
AE 529	Aircraft Vibration & Flutter	3	ME 510	Power Plant Systems	5
AE 439	Static Stability & Control	3	ME 514	Turbomachines	4
AE 541	Dynamic Stability & Control	3	ME 528	Air Conditioning & Refrigeration	4
AE 450	Dynamic Meteorology I	3	ME 532	Automatic Controls	3
AE 451	Dynamic Meteorology II	3	ME 536	Engineering Materials Science	3
CE 305	Water Supply & Disposal Sys.	5		Ferrous Metallurgy	3
CE 380	Theory of Structures II	5	ME 441	Engineering Systems	1-5
CE 504	Structural Analysis	4	ME 542	Computer Aided Design	3
CHE 540	Nuclear Engineering	5	ME 543	Photoelastic Stress and Strain Analysis	3
EE 322	Combinational Logic Circuits	3	ME 449	Professional Diagnostic Problems	4
EE 374	Electronics II	4	ME 450	Special Problems	1-5
EE 391	Electromagnetics I	4	MH 266	Topics in Linear Algebra	3
EE 482	Electromechanical Energy Conversion II	3	MH 310	Introduction to Calculus of Variations	3
EE 484	Electromech. Energy Conv. II Lab.	1	MH 501	The Calculus of Vector Functions	3
EE 483	Power System Analysis	3	MH 503	Engineering Mathematics II	5
IE 335	Linear Programming	4	PS 513	Introduction to X-Ray Crystallography	5
IE 327	Engineering Economic Analysis	5	PS 525	Principles of Nuclear Energy Systems	5
IE 553	Dynamic Programming	3			
ME 502	Introduction to Optimal Systems	4			

Materials Engineering

The curriculum in Materials Engineering is administered by the Department of Mechanical Engineering of the School of Engineering. It is an interdisciplinary curriculum conducted cooperatively by academic departments of the School of Engineering and the School of Arts and Sciences through a faculty Materials Engineering Curriculum Committee.

Materials Engineering includes both the design of materials and materials processes to meet specific needs. Materials Engineers are employed in the basic metallurgical, ceramics, plastics, electronics, aerospace, mechanical, process, chemical, and nuclear power industries.

The curriculum in Materials Engineering contributes the necessary foundation in the humanities, basic sciences, engineering sciences, and particularly in the science of the relationship of structure to properties. The curriculum prepares the engineer for professional practice or graduate study. Many materials engineers occupy key positions in industry, government, research, and education.

Materials Engineering courses include the subjects of ceramic, metallic, and plastic materials design with the emphasis placed upon the structure of each type and its influence on the properties and performance in service. Fundamental relationships are emphasized to prepare the engineer to meet effectively modern design challenges that will be encountered. The equipment available is comprehensive and modern and includes metallurgical microscopes, X-ray diffraction and radiographic facilities, an electron microscope, and a variety of types of chemical and mechanical processing and testing machines.

Curriculum in Materials Engineering (MTL)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 134)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
MH 264	An. Geom. & Cal.	5	PS 222	Gen. Physics III	4	CH 507	Physical Chem.	5
PS 224	Gen. Physics II	4	MH 265	Linear Diff. Equations	3	ME 301	Thermodynamics I	4
ME 205	Applied Mech. Statics	4	ME 202	Engr. Materials	3	ME 304	Engr. Materials	3
HY 102	World History or			Science-Structure	3		Science-Properties	3
HY 205	Techn. and Civiliz.	3	ME 207	Strength of Matls. I	3	ME 308	Computation Lab.	3
	Basic ROTC or Elect.	1	HY 103	World History or		EE 261	Lin. Cir. Anal. I	3
			HY 206	Techn. and Civiliz.	3		Basic ROTC or Elect.	1
				Basic ROTC or Elect.	1			

JUNIOR YEAR

CH 508	Physical Chem.	5	ME 338	Phase Diagrams	4	ME 336	Physical Anal.	
ME 335	Engr. Matls		ME 536	Engr. Materials			of Matls. I	4
	Science-Physical			Science-Ferrous		ME 425	Thermo. of	
	Metallurgy	4		Metallurgy	3		Matls. Syst.	4
EE 263	Linear Circuit	4	CH 515	Polymer Tech. I	4	ME 448	Intr. to Ceramics	3
	Analysis II	4	SC 202	App. Sp. Comm.† or		CH 516	Polymer Tech. II	3
ME 521	Heat Transfer	4	EH 304	Tech. Writing†	3		Hum.-Soc. Elect.*	3
				Technical Elective	5			

SENIOR YEAR

ME 337	Phys. Anal. of		ME 435	Phys. Anal. of		ME 446	Theoretical	
	Matls. II	4		Matls. III	4		Matls. Engr.	3
ME 445	Transfer. in		CHE 575	Rate Processes		ME 447	Mechanics of	
	Condensed Phases	4		In Matls.	3		Engr. Matls.	4
	Technical Elect.	5	EE 412	Electrical Prop.		ME 451	Advanced Projects	3
	Hum.-Soc. Elect.*	5		of Materials	3	PS 513	Intr. to X-ray	
				Hum.-Soc. Elect.*	6		Crystallography	5
				Technical Elect.	1		Hum.-Soc. Elect.*	3

TOTAL—210 QUARTER HOURS

†Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) or EH 304 (3 hrs.) and three additional hours approved by the Chairman of the Materials Engineering Curriculum Committee.

*See page 133 for the selection of Humanistic-Social Electives.

NOTE: The sequence CH 111 and CH 112 may be substituted for the sequence CH 103/CH 103L and CH 104/CH 104L.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below other subjects may be used as technical electives upon approval of the Chairman of the Materials Engineering Curriculum Committee.

CHE 540	Nuclear Engineering	5	ME 321	Dynamics I	4
CHE 560	Introduction to Plastics	3	ME 543	Photoelastic Stress and	
CHE 585	Air Quality Engineering	4		Strain Analysis	3
CH 207	Organic Chemistry	5	ME 449	Professional Diagnostic Problems	4
CH 510	Intermediate Inorganic Chemistry	5	PS 300	Intermediate Electricity	
CH 413	Analytical Chemistry	5		and Magnetism I	4
CE 509	Environmental Health Engineering	5	PS 303	Optics	4
EE 301	Engineering Instrumentation	3	PS 304	Applied Spectroscopy	5
EE 397	Introduction to Acoustics		PS 509	Introduction to Reactor Physics I	5
	and Noise Control	3	PS 514	Electron Optics and Microscopy	5
EE 413	Physical Electronics	3	PS 515	Intermediate Modern Physics I	5
EE 586	Direct Energy Conversion	3	PS 535	Introduction to Solid State Physics	5
GL 301	Mineralogy I	5	TE 305	Fiber Technology	3
IE 410	Engineering Statistics	5	TE 424	Man-Made Fibers I	5
ME 316	Strength of Materials II	5			

Department of Textile Engineering

The programs in the Department of Textile Engineering are designed to be sufficiently flexible to serve the needs of the student who seeks a career in the Textile Industry. Textiles is a truly multi-disciplinary program, and frequently a career in this field will draw on knowledge from the sciences, arts, combinations of these, economics, business and others.

The curricula are planned to provide for the needs of students as perceived by them and assisted by the faculty of the Department.

Well equipped laboratories complement the lecture program. These laboratories represent the types of equipment, bench study and research capabilities so vital to the learning of and contributing to a career in the industry.

The size and diversity of textiles and the allied industries provide careers in manufacturing, research, machinery design, chemicals and dyestuffs, sales, styling and design, technical service and others. Too, the student has the opportunity to prepare for graduate school if he or she desires.

For those students who want to plan their education path in conjunction with industrial experience the Alabama textile industry cooperates with the Department of Textile Engineering through the Cooperative Education Program as described on page 27.

The Textile Engineering Department conducts both applied and fundamental research. In cooperation with the Engineering Experiment Station, and other segments of the University, the Department serves textiles through the utilization of its facilities. In conjunction with research undertaken by the faculty, undergraduates may have the opportunity to conduct research in areas of their special interest. Graduate students from other disciplines are welcome to conduct approved research that may be applied toward their graduate program requirements.

The Department of Textile Engineering offers three curricula to prepare for a career in one of the many facets of the industry. Textile courses in these curricula are combined with courses offered by other departments of the University to provide basic instruction in the fundamental sciences, engineering, technology and humanistic-social studies. The three curricula are:

Textile Engineering—The curriculum in Textile Engineering offers study in basic engineering. It includes engineering science, humanistic-social studies, and the textile subjects needed for a fundamental understanding of the textile processes, materials and industry. It prepares students for graduate study and careers in textile research, engineering, production and management in the primary textile industry and allied industries, such as the manufacture of textile machinery and man-made fibers.

Textile Chemistry—Students in this curriculum study the chemistry and physics of natural and man-made fibers and the theory and practice of textile dyeing and finishing. It prepares students for graduate work and careers as chemists and dyers in the textile, man-made fibers, dyestuff and other industries allied to textiles.

Textile Management—This curriculum prepares students for production, administrative and managerial positions in a textile career. In their junior and senior years students major in production, sales, or design according to their professional needs.

Curriculum in Textile Engineering (TE)

FRESHMAN YEAR

(See Pre-Engineering Curriculum, page 134)

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
TE 210	Fiber Process	5	TE 220	Weav. & Des. I	5	TE 211	Yarn Mtg. I	5
MH 264	An. Geom. & Cal.	5	PS 222	Gen. Phys. III	4	ME 205	App. Mech. & Statics	4
PS 221	Gen. Physics II	4	MH 265	Linear Dif. Eq.	3	ME 202	EMS-Structures	3
HY 102	World History*	3	HY 103	World History*	3	SC 202	App. Sp. Comm.**	3
	Basic ROTC or Elect.	1	TE 101	Intr. Textiles	1	TE 250	Tuft. Carpet Fund.	2
				Basic ROTC or Elect.	1		Basic ROTC or Elect.	1

First Quarter			JUNIOR YEAR			Third Quarter		
TE 340	Intr. to Knit.	3	EE 263	Circuit Ana. II	4	EE 301	Instrumentation	3
EE 261	Circuit Ana. I	3	ME 207	Stren. Mtrls. I	3	ME 340	Fluid Mech. I	3
TE 307	Bleach. & Dyeing	5	TE 320	Weav. & Des. II	5	TE 324	Phy. Testing	3
TE 325	Text. Qual. Cont.	2	PS 320	Mod. Phys./Engrs	3	ME 321	Dynamics I	4
ME 301	Thermodynamics I	4	IE 201	Ind. Admin.	3	IE 204	Computer Prog.	3
Second Quarter			SENIOR YEAR			Fourth Quarter		
EC 200	Gen. Economics	5	TE 406	Text. Costing	5	TE 424	Man-Made Fibers	5
TE 408	Warp Prepara.	3	P3 211	Gen. Psychology	5	TE 431	Fabric Analysis	3
EH 304	Tech. Writing**	3	TE 305	Fiber Technology	3	TE 412	Text. Mgt.	3
TE 319	Chem. Testing	2		Technical Elective	5		Technical Elective	5
	Hum.-Soc. Elect.†	3						

TOTAL—205 QUARTER HOURS

*HY 205, HY 206 can be taken for HY 102 and HY 103.

**Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) and EH 304 (3 hrs.).

†See page 133 for the selection of Humanistic-Social Electives.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

MN 241	Business Law	4	TS 308	Gauges & Measurements	5
EC 402	American Industries	5	TE 321	Weaving & Design III	5
IE 316	Electronic Data Proc.	4	TE 323	Yarn Manufacturing II	3
IE 310	Motion & Time Study	5	TE 425	Man-Made Fibers II	5
IE 320	Engineering Economy	5	TE 317	Dyeing & Finish	5

Curriculum in Textile Chemistry (TC)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
CH 111	Gen. Chem.	5	CH 112	Gen. Chem.	5	CH 113	Gen. Chem.	5
MH 160	Pre-Cal. W. Trig.	5	MH 161	An. Geom. & Cal.	5	MH 162	An. Geom. & Cal.	5
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
TE 101	Intr. Textiles	1	HY 101	World History*	3	HY 102	World History*	3
	Basic ROTC or Elect.	1		Basic ROTC or Elect.	1		Basic ROTC or Elect.	1
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

MH 163	An. Geom. & Cal.	5	CH 205	An. Chem.	5	PO 209	Intr. Am. Govt.	5
CH 204	An. Chem.	3	MH 264	An. Geom. & Cal.	5	PA 202	Ethics & Soc.	5
HY 103	World History*	3	TE 220	Weav. & Des. I	5	TE 210	Fiber Process	5
SC 202	App. Sp. Comm.**	3	TE 250	Tuft Carpet Fund.	2	TE 305	Fiber Tech.	3
CH 204L	An. Chem. Lab.	2		Basic ROTC or Elect.	1		Basic ROTC or Elect.	1
	Basic ROTC or Elect.	1						

JUNIOR YEAR

PS 205	Intr. Physics	5	PS 206	Intr. Physics	5	CH 303	Organic Chem	5
TE 320	Weav. & Des. II	5	TE 307	Bleach. & Dyeing	5	TE 317	Dyeing & Finish	5
EH 304	Technical Writ.**	3	TE 211	Yarn Mfg. I	5	TE 319	Chem. Testing	2
TE 340	Intr. to Knit.	3					Technical Elective	5

SENIOR YEAR

CH 304	Organic Chem	5	CH 407	Physical Chem.	5	CH 408	Physical Chem	5
TE 408	Warp Preparation	3	TE 417	Adv. Dyeing	5	TE 406	Textile Costing	5
TE 412	Textile Mgt.	3	TE 424	Man-made Fibers	5		Technical Elective	5
TE 324	Phys. Testing	3		Hum.-Soc. Elect.†	4			
	Hum.-Soc. Elect.†	3						

TOTAL—205 QUARTER HOURS

*Recommended approved alternate sequence: HY 204-205-206.

**Six hours of Advanced ROTC may be substituted for SC 202 (3 hrs.) and EH 304 (3 hrs.).

†See page 133 for the selection of Humanistic-Social Electives.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department.

CH 305	Organic Chemistry	5	ME 301	Thermodynamics I	4
CH 404	Organic An. (Qual.)	5	MH 265	Diff. Equa.	3
CHE 460	Intr. to Plastics	3	TE 321	Weav. & Des. III	5
IE 204	Computer Program	3	TE 323	Yarn Mfg. II	3
IE 311	Engr. Statistics I	3	TE 418	Jacq. Weav. & Des.	2
IE 320	Engineering Economy	5	TE 425	Man-Made Fibers II	5
ME 207	Stren. of Mat. I	3	TE 431	Fabric Analysis	3

Curriculum in Textile Management (TM)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 160	Pre-Cal. W. Trig.	5	MH 161	Al. Geom. & Cal.	5	CH 103	Fund. of Chem.	5
EH 101	English Comp.	3	PA 202	Ethics & Soc.	5	EH 103	English Comp.	3
HY 101	World History*	3	EH 102	English Comp.	3	HY 103	World History*	3
TS 102	Graphic. Com. & Des.	2	HY 102	World History*	3	IE 201	Indust. Adm.	3
TE 101	Intr. Textiles	1	PE	Basic ROTC or Elect.	1	TS 113	Mach. Tool Lab	1
PE	Basic ROTC or Elect.	1	PE	Physical Education	1	PE	Basic ROTC or Elect.	1
	Physical Education	1					Physical Education	1

SOPHOMORE YEAR

EC 200	Gen. Economics	5	EC 202	Economics II	5	ACF 215	Fund. Acctng.	5
PG 211	Psychology	5	PS 200	Fund. of Physics	5	PO 209	Intr. Am. Govt.	5
TE 210	Fiber Process.	5	TE 220	Weav. & Design	5	TE 211	Yarn Mfg. I	5
TE 305	Fiber Technology	3		Basic ROTC or Elect.	1		Basic ROTC or Elect.	1
	Basic ROTC or Elect.	1				TE 250	Tuft. Carpet Fund.	2

JUNIOR YEAR

MN 207	Data Process.	5	EC 274	Statistics	5	MT 331	Marketing	5
TE 307	Bleach & Dyeing	5	TE 320	Weav. & Des. II	5	TE 317	Dyeing & Finish	5
TE 323	Yarn Mfg. II	3	TE 324	Phys. Testing	3	TE 321	Weav. & Des. III	5
TE 319	Chem. Testing	2	EH 304	Technical Writing**	3	TE 325	Tex. Qual. Cont.	2
TE 340	Intr. Knit	3						

SENIOR YEAR

EC 445	Indus. Relat.	5	MN 442	Personnel Mgt.	5	TE 424	Man-Made Fibers	5
TE 406	Text. Costing	5	TE 408	Warp Prep.	3	TE 412	Textile Mgt.	3
TE 418	Jacq. Weav. & Des.	2	SC 211	Fund. Sp. Comm.*	5	TE 431	Fabric Analysis	3
	Technical Elective	5		Hum.-Soc. Elect.†	3		Technical Elective	5

TOTAL—204 QUARTER HOURS

†See page 133 for the selection of Humanistic-Social Electives.

**Six hours of Advanced ROTC may be substituted for SC 211 or EH 304 with extra hours used for Hum.-Soc. Elective.

*Recommended approved alternate sequence: HY 204-205-206.

SUGGESTED TECHNICAL ELECTIVES

In addition to the subjects listed below, other subjects may be used as technical electives upon approval of the Head of the Department:

TE 417	Advanced Dyeing	5	IE 302	Production Con. Tech.	3
TE 425	Man-Made Fibers II	5	IE 310	Motion & Time Study	5
ACF 212	Principles of Accounting	4	IE 320	Engineering Economy	5
MN 310	Principles of Mgt.	5	IE 401	Safety Engineering	3
MN 241	Business Law	4	TS 308	Gauges & Measurements	5
MN 346	Human Rel. & Mgt.	5	PG 461	Industrial Psychology	5
MT 437	Sales Management	5			

Auburn School of Aviation

The Auburn School of Aviation was established in 1942 as a department of the School of Engineering to offer flight education for students of the University, for the Armed Forces, and for the general public; and to serve the citizens of Alabama and the Southern region by providing other services in aviation. The School cooperates fully with the Federal Aviation Administration and other organizations in conducting special aviation research and education programs.

In conjunction with the Aerospace Engineering Laboratories located on the campus, the airport serves as a Aerospace laboratory of practical training for students enrolled in the curricula of Aviation Management and Aerospace Engineering. Flight courses offered include private, commercial, multi-engine, instrument, flight instructor, and airline transport. These courses are offered for credit in the Aviation Management Curriculum and are also available on a noncredit basis.

The University owns a 322-acre airport, conveniently located within three miles of the campus, with two lighted, 4,000-feet, paved runways; a two-story

Administration Building; two large hangars; and a five-unit T-Hangar. The School currently operates ten single engine aircraft, two twin engine aircraft, and one flight simulator.

In addition to flight education, other services such as airplane storage and servicing are provided at the airport. The School also provides air transportation anywhere in the United States for University faculty and staff.

The Auburn School of Aviation is fully certified by the FAA as an Approved Ground and Flight School with examining authority for private pilots. The School is also approved by the State Department of Education for flight instruction under the U.S. Veterans Administration education program. The FAA has designated the Director of the Auburn School of Aviation as an Aircraft Inspection Representative and the Associate Director and Supervisor of Flight Education as Pilot Examiners.



School of Home Economics

RUTH L. GALBRAITH, *Dean*

HOME ECONOMICS is a professional program with its roots in the arts, sciences, and humanities. It is a complex of studies serving many purposes—broad liberal education, preparation for careers, and a background for home and family living. Areas of specialization are concerned with many aspects of environment, health, and human development. With emphasis on both breadth of knowledge and its application to the solution of human problems, Home Economics offers professional or pre-professional preparation for an increasing variety of positions with opportunities available in education, business, industry, and government.

Programs of study leading to the Bachelor of Science degree can be planned within eleven curricula in the School of Home Economics. These curricula are designed with flexibility to meet the needs of students with varying interests. The School includes the Departments of Consumer Affairs, Family and Child Development, and Nutrition and Foods.

Department of Consumer Affairs

The Department of Consumer Affairs focuses on the physical environment and resources, including personal interaction with this environment. Three majors are offered in this department: Clothing, Textiles, and Related Art; Fashion Merchandising; Housing, Interior Furnishings, and Equipment. These curricula lead to careers in business and government which apply science and technology to study consumer needs, to evaluate consumer products and to inform consumers of the findings.

Clothing, Textiles and Related Art (CT)

Clothing, Textiles, and Related Art is a professional three-option curriculum providing preparation in areas of specialization related to students' professional goals. Diversification within the major allows application of knowledge in such varied fields as textile and apparel design, production and promotion; textile science; fashion journalism; and consumer-producer relations. A unique interdisciplinary potential involving Clothing and Textiles, Textile Engineering, the School of Business, the Agricultural Experiment Station (for research) and the Cooperative Extension Service exists on one campus located in a textile area.

Curriculum in Clothing, Textiles, and Related Art (CT)

Options: Clothing, Textile Design, Textile Science

First Quarter			FRESHMAN YEAR			Third Quarter		
			Second Quarter					
MH 140	College Alg.*	5	CH 103	Gen. Chem.	4	CA 105	Fund. of Clo.	5
CA 116	Art for Living I	3	CH 103L	Gen. Chem. Lab.	1	CH 104	Gen. Chem.	4
CA 116L	Art for Liv. Lab.	2	CA 115	Clothing & Man	3	CH 104L	Gen. Chem Lab.	1
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY/AT**		3	HY/AT**		3	HY/AT**		3
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
EC 200	Economics I.....	5	NF 112	Nutr. & Man.....	3	CA 225	Textiles.....	5
PG 211	Psych. I or FED 213.....	3	CH 203	Org. Chem.....	5	SY 201	Sociology.....	5
	Human Growth and Development.....	5	CA 113	Housing for Man.....	3	SC 202	App. Sp. Comm.....	3
EH 253	English Lit.....	3	EH 254	English Lit.....	3		Elective.....	5
EH 260	or 261, or 262 Sur.....	3	EH 260	or 261, or 262 Sur.....	3			
	Lit. West World.....	3		Lit. West World.....	3			
FCD 157	Fam. & Human Dev.....	3		Prof. Elective.....	3			

JUNIOR YEAR

PS 204	or 205 Physics.....	5	BY 220	Intr. Microbio.....	5	CA 345	Creative Crafts or.....	
JM 315	Tech. Journalism.....	3	CA 313	Home Furnishings.....	5	CA 385	Creative Weaving.....	3
	Prof. Electives.....	8	FCD 323	Man the Consumer.....	3		Prof. Electives.....	13
				Elective.....	5			

SENIOR YEAR

Prof. Electives.....	8	CA 415	History of Textiles or.....		CA 431	Man-Environment Relations.....	2
Electives.....	11	CA 425	History of Costume.....	5		Electives.....	16
			Prof. Electives.....	13			

TOTAL—205 QUARTER HOURS

*Students choosing Textile Science Option take MH 160 Pre-Cal/Trig.

**Students may take any combination of World History, HY 101-102-103, Tech. and Civilization, HY 204-205-206, Hist. of Art, AT 171-172-173.

CLOTHING OPTION-APPROVED PROFESSIONAL ELECTIVES

45 hours selected from ANT 203; CA 205, 206, 216, 226, 310, 316, 395, 405, 555, 556, 490; EC 274, 574; PG 330, 561; SY 305, 311; JM 221, 421.

TEXTILE DESIGN OPTION—APPROVED PROFESSIONAL ELECTIVES

45 hours selected from AT 111, 112, 113, 121, 122, 123; CA 205, 216, 303, 343, 345, 375, 395, 515, 525, 535, 465, 466, 575, 576, 586, 587, 588, 490; TE 220, 230, 418.

TEXTILE SCIENCE OPTION—APPROVED PROFESSIONAL ELECTIVES

45 hours selected from BY 401; CA 435, 475, 483, 490; CH 204, 207, 208, 303, 304, 305, 316, 404; MH 161, 162, 163; PS 205, 206; TE 305, 307, 317, 319, 324, 417, 424, 425.

Students with other specialized professional goals in Clothing, Textiles and Related Arts should plan an appropriate coordinated program of electives to provide needed knowledge and competence.

Students interested in combining Clothing and Textiles with teacher certification, consult adviser for specific course requirements.

All electives must be approved by the student's adviser.

Fashion Merchandising (FM)

Fashion Merchandising prepares majors for such positions as buyer or assistant buyer, comparison shopper, fashion stylist or coordinator, merchandise manager, fashion promoter, or a store owner-manager. Ten weeks of retail training is included in the fashion merchandising curriculum.

Curriculum in Fashion Merchandising (FM)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 140	College Algebra.....	5	CH 103	Chemistry.....	4	CH 104	Chemistry.....	4
CA 116	Art for Liv. I.....	3	CH 103L	Chemistry Lab.....	1	CH 104L	Chemistry Lab.....	1
CA 116L	Art for Liv. Lab.....	2	CA 115	Clothing & Man.....	3	FCD 157	Fam. & Human Dev.....	3
EH 101	English Comp.....	3	EH 102	English Comp.....	3	EH 103	English Comp.....	3
HY/AT*	.....	3	HY/AT*	.....	3	HY/AT*	.....	3
PE	Physical Education.....	1	PE	Physical Education.....	1	NF 112	Nutrition & Man.....	3
						PE	Physical Education.....	1

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
CH 203	Org. Chem.	5	EC 202	Economics II	5	ACF 211	Accounting	4
EC 200	Economics I	5	PS 200	Physics	5	CA 225	Textiles	5
EH**			SY 201	Sociology	5	PG 211	Psychology I	5
CA 205	Cloth. Consumption & Sel.	3	CA 113	Housing for Man	3	SC 202	App. Sp. Comm.	3
	Elective	4						

*Students may take any combination of World History, HY 101-102-103, Tech. and Civilization, HY 204-205-206, Hist. of Art, AT 171-172-173.

**Students may choose one course from English Lit. EH 253, or Sur. Lit. Western World, EH 260-261-262.

JUNIOR YEAR

MT 331	Marketing	5	BY 220	Intr. Microbio.	5	CA 325	Fash. Merch.	5
CA 226	Fash. Sketch	3	CA 316	Fash. Analysis	5	MT 432	Promotional Strat.	5
JM 315	Tech. Journ.	3	MT 433	Retail Store Mgt.	4		Prof. Elective*	5
	Prof. Electives*	8	FCD 323	Man the Consumer	3		Elective	6

SENIOR YEAR

CA 335	Retail Training	8	CA 516	Apparel Qual. Eval.	5	CA 525	History of Cost.	5
			CA 535	Textile Testing	5	CA 431	Man-Env. Rel.	2
				Electives	9		Prof. Electives*	10

TOTAL—205 QUARTER HOURS

*Professional Electives—6 of the 23 hours selected from among CA 105, 206, 385, 575, 583. Other suggested professional electives are ACF 212; CA 524, EC 206, 274; MN 310, 241, 242, 346, 442; MT 436, 437, 441; SY 505; any CA courses.

Fashion Institute of Technology One-Year Transfer Program

Selected students in the Clothing, Textile Design, or Fashion Merchandising curricula may apply for a special one year program during their junior year at the Fashion Institute of Technology in New York City. Arrangements can be made to transfer the FIT credits to Auburn and to receive, in addition, the Associate in Applied Science degree from FIT.

The support received by FIT from the Educational Foundation for the Fashion Industries and its unique location in mid-town Manhattan enable students to observe the fashion industry in operation and have their work evaluated by outstanding designers who lecture, demonstrate, and evaluate the finished products. Students in fashion buying and merchandising also participate in a cooperative work-study program in the fashion industry.

For further information, contact the Head of the Consumer Affairs Department.

Housing, Interior Furnishings and Equipment (HEQ)

The Housing, Interior Furnishings and Equipment program prepares students for positions with public utilities, manufacturers, retailers, research centers, governmental agencies (including cooperative extension), retail associations and other businesses.

Curriculum in Housing, Interior Furnishings, and Equipment (HEQ)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 140	College Algebra	5	CH 103	Gen. Chem. & Lab.	5	CH 104	Gen. Chem. & Lab.	5
CA 116	Art for Living	3	CA 115	Clothing and Man	3	FCD 157	Family & Human Dev.	3
CA 116	Art for Liv. Lab.	2	CA 113	Housing and Man	3	EH 103	English Comp.	3
NH 101	English Comp.	3	EH 102	English Comp.	3	HY 102	World History*	3
EF 112	Nutrition and Man	3	HY 101	World History*	3	SC 202	App. Sp. Comm.	3
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

First Quarter			Second Quarter			Third Quarter		
CA	225	Textiles.....5	EC	200	Economics I.....5	CA	233	Home Equipment I.....5
CH	203	Organic Chem.....5	PS	204	Foundations of.....5	EC	202	Economics II.....5
PG	211	Psychology I.....5	EH	253	English Lit.....5	SY	201	Intr. to Sociology.....5
HY	103	World History.....3	EH	260,	or 261 or 262-Sur.....3	EH	254	English Lit.....3
					Lit. West. World.....3	EH	260,	or 261, or 262-Sur.....3
					Electives.....4			Lit. West. World.....3

JUNIOR YEAR

CA	303	The House.....5	BY	220	Intr. Microbi.....5	CA	343	Int. Home Probs.....5
CA	313	Home Furnishing.....5	CA	333	Lighting Design.....5	JM	315	Tech. Journalism.....3
MT	331	Prin. of Mkt.....4	CA	310	Mass Comm. Fam. &.....3	CA	514	Soc. Probs.....5
FCD	323	Man the Consumer.....3			Cons. Svc.....3			of Housing.....5
					Prof. Electives.....4			Prof. Electives.....5

SENIOR YEAR

CA	453	Consum. & Mkt.....3			Prof. Elective.....13	CA	431	Man-Envr. Rel.....2
		Prof. Electives.....10			Electives.....3			Prof. Electives.....8
		Electives.....2						Electives.....6

*Recommended alternate sequences: Equipment Option—HY 204-205-206. Furnishing Option—AT 171-172-173. Housing Option—HY 204-205-206.

TOTAL—205 QUARTER HOURS

EQUIPMENT OPTION—APPROVED PROFESSIONAL ELECTIVES

16 hours selected from: CA 433, 535, 583, 593; NF 104.

10 hours selected from: MN 341; MT 432, 433, 441.

13 hours selected from: ACF 211, 323, 340; AR 360, 370; AT 111, 112; BSC 101, 206; CA 325, 335, 473; EC 206, 546, 555; EH 304, 345; FCD 333, 441, 443; MN 310, 242, 346, 455; NF 358; PG 561; SY 311; U 201.

FURNISHINGS OPTION—APPROVED PROFESSIONAL ELECTIVES

11 or 13 hours selected from: AR 360, 370; CA 345, 385, 515, 535, 573, 575, 583.

10 hours selected from: MT 432, 433, 441.

16 or 18 hours selected from: ACF 211, 323; AT 111.

HOUSING OPTION—APPROVED PROFESSIONAL ELECTIVES

19 hours selected from: FCD 267, 337, 441; NF 358; SY 202, 203, 204, 301, 309, 311, 501, 505, 508.

10 hours selected from: EC 206, 446, 455, 458, 459; FCD 443; MT 432, 441; PG 461.

10 hours selected from: AR 360, 370; AT 111, 112, 371, 372, 373; BSC 101, 206; CA 493; HF 221.

Department of Family and Child Development

The Department of Family and Child Development is concerned with the processes of growth and development of the individual in his daily living from infancy to old age and with the creation of techniques for facilitating such development. Its primary mission is the promotion of self-fulfillment of individuals and families through maximum utilization of material and human resources.

Four curricula, including six majors, are offered in this department: Family and Child Development (General Family and Child Development, Day Care and Programs for Young Child, Maternal and Child Health), Family and Child Services, Home Management and Family Economics.

Family and Child Development (FCD)

The major in Family and Child Development prepares students for professional work with families and individuals of all age levels, with challenging careers in programs for young children and youth, family life education, and business.

Curriculum in Family and Child Development (FCD)

Major in General Family and Child Development

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Biology	5	BI 104	Bio. Hum. Affairs	5	SY 201	Sociology	5
EH 101	Eng. Comp.	3	PG 211	Psychology I	5	EH 103	Eng. Comp.	3
HY *	Eng. Comp.	3	EH 102	Eng. Comp.	3	FCD 157	Fam. Human Dev.	3
PE	Physical Education	1	HY *	Eng. Comp.	3	NF 112	Nutr. Man	3
			PE	Physical Education	1	HY *	Physical Education	3
						PE	Physical Education	1

SOPHOMORE YEAR

FCD 267	Child Dev. I	4	FCD 268	Family I	5	EC 200	Economics	5
CA 115	Cloth. for Man	3	SC 273	Gr. Prob. Solving	5	FCD 300	App. Child Study	5
	Electives	10	MH or	PA (Appr.)	5	CA 116	Art Living	3
			CA 113	Housing for Man	3		Electives	4

JUNIOR YEAR

FCD 301	Child Dev. II	4	FCD 302	Child Dev. III	4	FCD 323	Man the Consumer	3
FCD 305	Family II	4	FCD 306	Family III	4		Prof. Electives	15
	Liberal Ed. Elect.	5		Electives	8			
	Prof. Electives	5						

SENIOR YEAR

	Prof. Electives	13	FCD 420	Res. Child Dev.	4		Electives	11
	Liberal Ed. Elect.	5	CA 431	Man-Env. Rel.	2		Prof. Electives	7
				Prof. Electives	7			
				Liberal Ed. Elect.	5			

TOTAL—205 QUARTER HOURS

Major in Day Care and Programs for Young Children

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Biology	5	PG 211	Psychology	5	SY 201	Sociology	5
MH or	PA (approved)	5	EH 102	Eng. Comp.	3	EH 103	Eng. Comp.	3
EH 101	Eng. Comp.	3	ZY 105	Intr. Hum. Physiol.	3	FCD 157	Fam. Human Dev.	3
HY *	Eng. Comp.	3	HY *	Intr. Hum. Physiol.	3	NF 112	Nutrition & Man	3
PE	Physical Education	1	PE	Physical Education	1	HY *	Physical Education	3
						PE	Physical Education	1

SOPHOMORE YEAR

FCD 267	Child Dev. I	4	FCD 268	Family I	5	EC 200	Economics	5
CA 115	Cloth. Man	3	SC 273	Gr. Prob. Solving	5	FCD 300	App. Child Study	5
CA 113	Hous. for Man	3	CA 116	Art Living	3		Prof. Electives	5
	Lib. Ed. Electives	5		Prof. Electives	3			
	Electives	3						

JUNIOR YEAR

FCD 301	Child Dev. II	4	FCD 302	Child Dev. III	4	FCD 323	Man the Consumer	3
FCD 305	Family II	4	FCD 306	Family III	4	FCD 437	Learn. Exp. Child	3
FCD 350	Intr. Day Care	3	FCD 351	Dev. Day Care Prog.	3	FCD 437L	Learn. Exp. Child	2
	Prof. Electives	5	FCD 347	Lab. Exp. Child	2	NF 492	Infant Child Nutr.	5
				Prof. Electives	4		Prof. Electives	5

SENIOR YEAR

FCD 467	Parent Education	4	FCD 420	Res. Child Dev.	4	FCD 457E	Fid. Exp. Parent Programs	5
FCD 471	Admin. Prog. Child	3	CA 431	Man-Env. Rel.	2	FCD 497D	Fid. Exp. Day Care & Prog.	13
	Lib. Ed. Electives	3		Lib. Ed. Electives	5		for Children or	8
	Prof. Electives	3		Prof. Electives	6	FCD 497D and	Prof. Electives	5
	Electives	3						

TOTAL—205 QUARTER HOURS

*Students may take any combination of World History, HY 101-102-103, Technology and Civilization, HY 204-205-206, History of Art, AT 171-172-173, and Western Literature, EH 260-261-262.

Family and Child Services (FCS)

Family and Child Services is a broadly-based curriculum designed to provide students with the relevant knowledge and motivation to enter employment in human service occupations and professions not requiring graduate education immediately upon receiving their bachelor's degree. The curriculum also is sound preparation for the student planning to enter graduate study.

Curriculum in Family and Child Services (FCS)

First Quarter			Second Quarter			Third Quarter		
BI 101	Biology	5	BI 104	Bio. Hum. Affairs	5	SY 201	Sociology	5
EH 101	English Comp.	3	PG 211	Psychology I	5	EH 103	English Comp.	3
NF 112	Nutr. & Man.	3	EH 102	English Comp.	3	FCD 157	Fam. Human Dev.	3
HY *		3	HY *		3	HY *		3
PE	Physical Education	1	CA 113	Housing for Man	3	PE	Physical Education	1
			PE	Physical Education	1			
SOPHOMORE YEAR			JUNIOR YEAR			SENIOR YEAR		
MH or	PA (Appr.)	5	EC 200	Economics	5	FCD 300	App. Child Study	5
FCD 267	Child Dev. I	4	FCD 268	Family I	5	SC 273	Group Problems	5
CA 115	Cloth. Man.	3	PG 215	Quant. Methods	5	PD 210	Amer. State Local Govt. Electives	5
	Liberal Ed. Electives	5	CA 116	Art for Living	3			
PO 325	Pub. Administra.	5	FCD 302	Child Dev. III	4	SY 375	Int. Soc. Work	5
FCD 301	Child Dev. II	4	FCD 308	Fam. Ch. Men. Hl	4	SY 308	Juv. Del.	5
FCD 305	Family II	4	FCD 323	Man Consumer	3	FDC 306	Family III	4
PG 330	Soc. Psychology	4		Prof. Electives	6		Electives	5
FCD 420	Rec. Res. Child Dev.	4	FCD 497	Dir. Field Exp.	5	FCD 499	Seminar	2
FCD 487	Int. Fid. Exp.	2		Prof. Electives	10	RSY 362	Comm. Organ.	5
CA 431	Man-Env. Rel.	2					Electives	5
FCD 310	Tech. Interviewing	2					Liberal Ed. Electives	5
	Electives	4						
	Prof. Electives	3						

TOTAL—205 QUARTER HOURS

*Students may take any combination of World History, HY 101-102-103, Technology and Civilization, HY 204-205-206, History of Art, AT 171-172-173, and Western World Literature, EH 260-261-262.

Home Management (HM)

The Home Management major is designed for students interested in a broad general education in home economics. Professional preparation is offered for positions in Cooperative Extension Service, home service and other areas of business requiring a background in home management and social science.

Curriculum in Home Management (HM)

First Quarter			Second Quarter			Third Quarter		
MH 140	College Algebra	5	BI 101	Prin. Bio.	5	BI 104	Bio. Hum. Affairs	5
CA 116	Art Ev. Liv.	3	NF 104	Prin. Fd. Prep	5	CA 105	Fund. Cloth.	5
EH 101	English Comp.	3	CA 115	Cloth. Man.	3	EH 103	English Comp.	3
NF 112	Nutr. Man.	3	EH 102	English Comp.	3	FCD 157	Fam. Hum. Dev.	3
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1
SOPHOMORE YEAR			JUNIOR YEAR			SENIOR YEAR		
EC 200	Econ. I	5	EC 201	Econ. II	5	FCD 267	Child Dev. I	4
SY 201	Sociology	5	NF 204	Meal Mgt.	5	FCD 268	Family I	5
SC 202	App. Sp. Com.	3	PG 211	Psych. I	5	PS 200	Found. Physics	5
CA 113	Housing Man.	3	HY 205	Tech. & Civ.	3	HY 206	Tech. & Civ.	3
HY 204	Tech. & Civ.	3						

JUNIOR YEAR

First Quarter			Second Quarter			Third Quarter		
CA 233	Home Equip.	5	FCD 333	Cons. Leg.	5	MN 241	Business Law	5
SC 273	Group Discus.	5	MT 331	Marketing	5	CA 343	Int. Home Prob.	5
FCD 323	Man Consumer	3		Liberal Ed. Electives	5	CA 333	Light Equip.	5
	Electives	3		Electives	3	CA 310	Mass Commun.	3

SENIOR YEAR

FCD 541	Fam. Finance	5	FCD 443	Home Mgt. Res.	5	CA 593	House Util.	3
	Liberal Ed. Electives	5	CA 553	Cons. & Mkt.	3	FCD 560	Mgt. Prob.	3
	Electives	5	CA 355	Con. Text.	3		Elective	10
			CA 431	Man-Env. Rel.	2			
				Liberal Ed. Electives	5			

TOTAL—205 QUARTER HOURS**Family Economics (FE)**

The curriculum in Family Economics prepares students for professional positions that deal primarily with the economic problems of families. These include positions in the following areas: credit counseling in banks, housing authorities, social service agencies, and independent credit counseling services; consumer protection with local, state, and federal agencies; and business and industry.

Curriculum in Family Economics (FE)**FRESHMAN YEAR**

First Quarter			Second Quarter			Third Quarter		
CA 116	Art for Liv.	3	BI 101	Prin. of Bio.	5	BI 104	Bio. Hum. Aff.	5
EH 101	English Comp.	3	CA 113	Hous. for Man	3	CA 115	Cloth for Man	3
FCD 157	Fam. & Hum. Dev.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
MH 160	Pre-Cal. w/Trig.	5	NF 112	Nutr. and Man	3	PG 211	Psychology I	5
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

EC 200	Economics I	5	EC 202	Economics II	5	FCD 268	Family I	5
HY 204	Tech. & Civ. I	3	HY 205	Tech. & Civ. II	3	HY 206	Tech. & Civ. III	3
SC 202	App. Speech Comm.	3	SY 201	Intr. to Soc.	5		Home Ec. Elective	5
	Lib. Ed. Elective			Prof. Elective	5		Lib. Ed. Elective	
	(Hum/Fine Art)	5					Math/Nat Sci	5

JUNIOR YEAR

CA 233	Home Equip.	5	CA 310	Mass Comm.	3	CA 431	Man-Environ. Rel.	2
FCD 323	Man the Consum.	3	FCD 333	Cons. Legislat.	5	CA 553	Cons. in the Mkt.	3
EH 345	Bus. Prof. Writ. or	3	MT 331	Marketing	5	EC 551	Int. Microecon	5
JM 315	Tech. Journ.	3		Prof. Elective	5	FCD 560	Mgt. Prob. in Home	3
MN 241	Bus. Law I	4					Home Ec. Elective	5
	Home Ec. Elective	3						

SENIOR YEAR

CA 514	Soc. Prob. Hous.	5		Electives	9	FCD 497	Directed Fld. Exp.	10
FCD 541	Fam. Finan. Mgt.	5		Home Ec. Elect	5		Family Economics	5
	Electives	3		Prof. Elective	5	FCD 409	Undergrad. Res.	5
	Prof. Elective	5					Home Ec. Elective	5
							Prof. Elective	5

TOTAL—205 QUARTER HOURS**Professional Electives**

Professional Electives for all programs of study are to be selected with the guidance of the faculty adviser. The list of Professional Electives is available in the department.

Internship Program

Students enrolled in all curricula within the department may apply for a directed field experience in their area of specialization. Application is to be made four quarters in advance of the term in which the internship is desired.

Certain prerequisites are to be satisfied before an internship is approved, and students are encouraged to select their professional and free electives carefully to insure the prerequisites are fulfilled. Normally, an internship may be taken for a minimum of 10 and a maximum of 15 credits. Information and application materials are available in the departmental office.

The department operates the Child Study and Family Life Center for training and research. Children are admitted to the Child Study Center educational program according to the special study needs of students and faculty. A tuition fee is charged.

Department of Nutrition and Foods

The Nutrition and Foods major is designed for students having a strong interest in the health, physical growth, and welfare of people, and the ability to apply scientific principles to the solution of problems. The sociological, psychological, physiological and economical aspects of food in nutritional status are integral parts of the program.

The department, through its majors in Coordinated Dietetics, Nutrition and Foods, Food Service Administration and Pre-Nursing Science, prepares students for teaching, research, and health service careers in educational institutions, hospitals, industry, and government.

Food Service Administration (FSA)

The Food Service Administration major trains students to manage food service operations. Food production, consumption and service is today the second largest business in the world and demands highly trained personnel.

Curriculum in Food Service Administration (FSA)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
*HY 101	World History	3	*HY 102	World History	3	*HY 103	World History	3
NF 112	Nutrit. and Man	3	CH 103	Gen. Chemistry	4	NF 204	Meal Mgt.	5
MH 140	College Algebra or		CH 103L	Chemistry Lab.	1	CH 104	Gen. Chemistry	4
MH 160	Pre-Cal. w/ Trig	5	NF 104	Prin. of Fd. Prep.	5	CH 104L	Chemistry Lab.	1
PE	Physical Education	1	PE	Physical Education	1	PE	Physical Education	1

SOPHOMORE YEAR

CH 203	Organic Chemistry	5	EC 200	Economics I	5	EC 202	Economics II	5
ACF 211	Accounting I	4	SY 201	Intr. Sociology	5	SC 211	Fund. Speech Comm.	5
PG 211	Psychology	5	BI 101	Biology	5	ZY 105	Human Physiology	5
EH	Lit. Elective	3	EH 304	Tech. Writ. or			Elective	3
			JM 315	Tech. Journalism	5			

JUNIOR YEAR

NF 464	Experimental Foods	5	BY 220	Intr. Microbiol. or		EC 350	Labor Economics	5
MN 310	Prin. of Mgt.	5	BY 300	Gen. Microbiol.	5	MT 331	Prin. of Mkt.	5
**	Prof. Electives	5	MN 241	Business Law I	4	**	Prof. Electives	5
	Electives	3	ADS 415	Food Plant San.	3		Electives	3
			**	Prof. Electives	5			

SENIOR YEAR

MT 432	Promot. Strategy	5	NF 356	Food Ser. Admin.	10	NF 416	Quant. Food Prep.	10
MT 437	Sales Mgt.	5	VED 413	Nature of Adult Ed.	4		Electives	5
CA 431	Man-Environ. Relat.	2		Elective	4			
**	Prof. Electives	5						

TOTAL—205 QUARTER HOURS

*Any combination of HY 101, 102, 103 World History; HY 204, 205, 206 Technology and Civilization; AT 171, 172, 173 History of Art or EH 260, 261, 262 Western Literature may be taken.

**To qualify for ADA membership through therapeutic and administrative dietetics students will be required to take the courses marked ** or the list of suggested professional electives.

Nutrition and Foods (NF)

Major areas of concentration in Nutrition and Foods include dietetics, nutrition and experimental foods with minors in food science, teaching, chemistry, biology, journalism, radio and television and others from which a student may select.

Curriculum in Nutrition and Foods (NF)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
BI 101	Biology	5	NF 104	Prin. of Food Prep.	5	CH 104	Gen. Chem. & Lab.	5
MH 140	or 160	5	CH 103	Gen. Chem. & Lab.	5	EH 103	English Comp.	3
EH 101	English Comp.	3	EH 102	English Comp.	3	HY 103	World History	3
HY 101	World History	3	HY 102	World History	3	NF 112	Nutr. & Man.	3
PE	Physical Education	1	PE	Physical Education	1	CA 115	Clothing & Man.	3
						PE	Physical Education	1

SOPHOMORE YEAR

CH 203	Organic Chem.	5	EC 200	Economics I	5	ZY 105	Human Physio.	5
NF 204	Meal Mgt.	5	PS 200	Physics	5	NF 318	Nut. Biochem.	5
SY 201	Intr. Socio.	5	PG 212	Psychology	3	CA 116	Art for Everyday Liv.	3
CA 113	Housing for Man.	3	EH 253	English Lit.	3	FCD 157	Family & Hum. Dev.	3

JUNIOR YEAR

FCD 323	Man the Consumer	3	BY 220	Intr. to Microbio. or		EH 301	Creative Writing or	
NF 356	Food Service Admin.	10	BY 300	Gen. Microbiology I	5	EH 304	Tech. Writing or	
FED 214	Psych. Fnds. of Ed.	5	SY 220	Statistics or		JM 315	Tech. Journalism	3
			BY 501	Biolog. Stats.	5	SC 202	App. Sp. Comm.	3
				Prof. Elective	8		Prof. Elective	10

SENIOR YEAR

NF 382	Prin. Normal Nutr. I	5	NF 392	Prin. Normal Nutr. II	5	NF 516	Oty. Food Prep.	10
	Prof. Elective	13	NF 564	Exp. Foods	5	CA 431	Man Envrn. Rel.	2
				Prof. Elective	6		Prof. Elective	4

TOTAL—205 QUARTER HOURS

*MH 140 College Algebra; MH 160 Pre-Cal. W. Trig.

Special areas of interest in Nutrition, Dietetics, Food Science, Communication in Food & Nutrition, Research and Teacher Education may be developed through choice of elective courses.

NUTRITION AND FOODS OPTIONS—PROFESSIONAL ELECTIVES

A. General Dietetics			C. Management		
ANT 203	Intr. Anthro.	5	ACF 211, 212	Accounting	5, 5
IE 480	DATA Proc. Fund.	5	EC 202	Economics II	5
NF 402	Diet Therapy	5	EC 250	Labor Econ.	5
NF 408	Independent Study	3-8	MN 310	Prin. Mgt.	5
B. Community Nutrition			MN 442	Personnel Mgt.	5
ANT 203	Intr. Anthro.	5	IE 480	Data Proc. Fund.	5
NF 358	Comm. & Fam. Health	3	NF 408	Independent Study	3-8
NF 402	Diet Therapy	5	D. Therapeutic & Clinical Dietetics		
NF 408	Independent Study	3-8	ANT 203	Intr. Anthro.	5
NF 422	Comm. Nutr.	10	ZY 424	An. Physiol.	5
NF 436	Food Ser. Sys.	5	NF 402	Diet Therapy	5
			NF 408	Independent Study	3-8

Coordinated Dietetics Program (CDP)

Upon completion of this program incorporating clinical experiences with classroom teaching, the student is eligible for Registration as a Dietitian by the American Dietetics Association.

Curriculum in the Coordinated Dietetics Program (CDP)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
EH 101	English Comp.	3	EH 102	English Comp.	3	EH 103	English Comp.	3
HY 101	World History*	3	HY 102	World History*	3	HY 103	World History*	3
MH 140	or 160**	5	NF 104	Prin. Food Prep.	5	CA 116	Art for Everyday	3
PE	Physical Education	1	PE	Physical Education	1		living	3
NF 112	Nutr. & Man.	3	CH 103	Fund. Chem. I.	4	PE	Physical Education	1
CA 113	Housing for Man	3	CH 103L	Gen. Chem. Lab.	1	CH 104	Fund. Chem. II.	4
						CH 104L	Gen. Chem. Lab.	1

SOPHOMORE YEAR

BI 101	Prin. Biol.	5	BI 103	Animal Biol.	5	BY 300	Microbiology	5
CH 203	Organic Chem.	5	PG 211	Psychology	5	ZY 251	Physiology	5
NF 204	Meal Mgt.	5	EC 200	Economics I	5	SY 201	Intr. Socio.	5
FCD 157	Family & Hum. Dev.	3	EH	Lit. Elective	3		Elective	3

JUNIOR YEAR

NF 307	Sur. Dietetics	2	NF 356	Food Ser. Ad.	10	NF 516	Quant. Food Prep.	10
NF 318	Nutr. Biochem.	5	NF 382	Prin. Normal Nutr.	5	NF 392	Prin. Normal Nutr. II.	5
VED 513	Nature Ad. Ed.	5				FCD 323	Man the Consumer	3
NF 564	Exp. Foods	5						

SENIOR YEAR

NF 522	Community Nutr.	10	NF 432	Med. Dietetics	10	NF 442	Ad. Med. Dietetics	10
NF 592	Infant & Child		CA 431	Man-Environ. Rel.	2		Electives	6
	Nutrition	5		Elective	5			
	Elective	3						

TOTAL—205 QUARTER HOURS

*HY 204, 205, 205 Tech. & Civil., EH 260, 261, 262 Sur. Lit. West. World, or AT 171, 172, 173 His. World Art may be substituted for HY 101, 102 and 103.

**MH 140 College Algebra, MH 160 Pre-Cal. with Trig.

Pre-Nursing Science (NS)

Pre-Nursing Science provides Nursing Science majors with a basic two-year program. Upon satisfactory completion, students will be assisted with transfer to an accredited School of Nursing for completion of the baccalaureate program in nursing. Emory University, the University of Alabama and other accredited schools of nursing have approved this program for meeting their pre-nursing requirements.

Curriculum in Pre-Nursing Science (NS)

FRESHMAN YEAR

First Quarter			Second Quarter			Third Quarter		
MH 140	College Algebra or		CH 104	Fund. of Chem. II.	4	CH 203	Organic Chem.	5
MH 160	Pre-Cal. w. Trig.	5	CH 104L	Gen. Chem. Lab.	1	**ZY 251	Physiology	5
CH 103	Fund. of Chem. I.	4	EH 102	English Comp.	3	EH	Lit. Elective	3
CH 103L	Gen. Chem. Lab.	1	**ZY 250	Human Anat. or		PG 211	Psychology I	5
EH 101	English Comp.	3	*BI 103	Animal Biology	5			
BI 101	Prin. of Biology	5	SY 201	Intr. to Sociology	5			

SOPHOMORE YEAR

**BY 300	Gen. Microbiol.	5	*EH 103	English Comp.	3	Professional or		
PG 330	Social Psychology	4		Professional or		Free Electives***	15-18	
ANT 203	Intr. to Ant.	5		Free Electives***	12-15			
NF 372	Fund. of Nutrition	3						

*Required only by Emory University.

**Required only by the University of Alabama, Birmingham.

***If students plan to attend the University of Alabama, Birmingham, they should transfer after their first year. Other students should choose courses which meet the requirements of the school they plan to attend.

Dual Objective Program with the School of Education

Dual objective programs with the School of Education (see p. 124) are open to students registered in the School of Home Economics in the following five majors:

Family and Child Development
Clothing, Textiles and Related Art
Nutrition and Foods

Home Management,
Family Economics
Housing and Equipment

Option in Cooperative Extension

Students enrolled in any of the majors in the School may prepare for a career in the Cooperative Extension Service through selection of certain courses as electives. The major of Home Management and Family Economics meets the requirements of this option. Other majors may also fulfill the requirements of the Cooperative Extension Service through scheduling of the following courses:

NF-104, 112, 204, 324, 362
CA-105, 233, 343, 225 or 355, 553
FCD-267, 323, 541, 467

GRADUATE WORK

The School offers work leading to the Master of Science degree, Master of Arts in College Teaching degree, and the Ph.D. degree in Experimental Nutrition, an interdepartmental program.



School of Pharmacy

BEN F. COOPER, *Dean*

THE SCHOOL OF PHARMACY is a member in good standing of the American Association of Colleges of Pharmacy, which promotes pharmaceutical education. It is also fully accredited by the American Council on Pharmaceutical Education, which formulates the educational, scientific and professional principles and standards which approved Schools of Pharmacy are required to meet and maintain.

The five-year curriculum in pharmacy prepares students for licensure by the pharmacy boards of all states as well as for careers in those areas of pharmacy not requiring registration.

The background provided by the five-year program prepares students to pursue a variety of careers. Excellent opportunities exist in community pharmacy, hospital pharmacy, industrial pharmacy, (research, product development, analytical control and product manufacture, sales and distribution), wholesale pharmacy, public health, regulatory agencies, toxicology, and research and teaching after further education.

Curriculum in Pharmacy (PY)

Admission Requirements

The course requirements for admission to the School of Pharmacy may be satisfied by completion of the six quarter pre-pharmacy curriculum as outlined on page 91. Any or all of these requirements may be met by transfer of credit from other institutions. Transfer students from junior colleges may receive no more than 98 quarter hours credit for the pre-pharmacy curriculum.

Admission is limited and is contingent upon available facilities and faculty. To be considered for admission the applicant must have a grade point average of 1.00 or higher based on all courses attempted as well as a science index (grade point average on the biological and physical science courses) of 1.00 or better. Applicants may be asked to appear for a personal interview. The student must make application to the Pharmacy Admissions Committee for determination of eligibility. Special application forms are available from the School of Pharmacy and the University Office of Admissions. Both resident and transfer students must submit an application to the Pharmacy Admissions Committee at least 120 days prior to the expected date of admission. This application is in addition to the one required for admission to the University. In addition, two letters of recommendation and an acceptable score on the Pharmacy College Admissions Test (PCAT) are required.

Any student in the pharmacy curriculum who is subjected to academic suspension and desires to re-enter the School of Pharmacy must, in addition to complying with the pertinent University regulation, be approved by the Pharmacy Admissions Committee for re-admission.

Attention is called to the following regulation of the American Association of Colleges of Pharmacy: "Each member college shall require of each candidate for a degree in pharmacy completion of not less than five full academic years of training including both prepharmacy instruction and a minimum of three years of professional instruction," with the exception that waiver (of usually one quarter) of the three years of professional instruction requirement may be granted provided there has been proper sequencing of professional courses, adherence to stated course prerequisites, and demonstrated scholarship. In addition, other "appropriate factors" shall be considered in arriving at the decision of whether to grant the waiver.

Curriculum Options

After admission to the School of Pharmacy students may choose a professional option in preparation for community pharmacy, hospital pharmacy, industry, research, or teaching. The program of each student under either option must be approved by the adviser. Either option will adequately prepare students for State Board examinations.

Students who are qualified and have the prerequisites may take up to 10 hours of graduate courses in their fifth year. Such work cannot be applied toward both the undergraduate and graduate degrees. Registration in graduate courses must be approved by the Dean of the Graduate School, if the hours are to be applied toward a graduate degree.

Continuing Education and Extension Services

Continuing education and extension service programs are available to Alabama pharmacists. Meetings are held throughout the year, enabling Alabama pharmacists to avail themselves of the educational programs. Faculty members of the School, as well as practicing pharmacists and leaders in industry and in state and federal governmental agencies, serve as instructors.

Curriculum In Pharmacy (PY)

FIRST PROFESSIONAL YEAR

First Quarter			Second Quarter			Third Quarter		
ZY	560	Mam. Physiol. I.....5	ZY	561	Mam. Physiol. II.....5	PY	347	Human Pathology.....5
CH	301	Biochemistry I.....5	CH	302	Biochemistry II.....5	BY	302	Med. Microbiol.....5
PY	301	Pharmaceutics I.....5	PY	302	Pharmaceutics II.....5	PY	303	Pharmaceutics III.....5
		Elective.....3	PY	316	Mod. Methods of Drug Analysis.....3	PY	346	Clin. Eval. Drug Therapy.....3

SECOND PROFESSIONAL YEAR

PY	420	Med. Chem. I.....5	PY	421	Med. Chem. II.....4	PY	422	Med. Chem. III.....5
PY	531	Pharmacology I.....5	PY	532	Pharmacology II.....5	PY	533	Pharmacology III.....4
PY	467	Drug Lit. & Stat.....3	PY	447	Therapy of Disease I.....3	PY	448	Therapy of Disease II.....3
MN	310	Prin. Management.....5	MN	207	Electr. Data Process.....5	PY	464	Pharm. Jurispru- dence.....5
			PY	432	Chem. Pharmacol. Lab. I	PY	433	Chem. Pharmacol. Lab. I

THIRD PROFESSIONAL YEAR

First Quarter	Second Quarter	Third Quarter
Elective &	Elective &	Externship.....
Option.....17	Option.....17	PY 459 Externship.....17

NOTES: 1. Proficiency in typing is required for completion of PY 301.

2. Students must participate in field trips to a pharmaceutical manufacturing plant during their junior or senior year, and to a wholesale drug company during their senior year.

3. A set of Class C metric and Apothecaries' weights, which may be purchased from Pharmacy Supply, is required for all Pharmacy laboratories.

4. Students may be required to spend one quarter of their third professional year in an off-campus, structured, externship experience.

5. Students enrolled in clinical or externship courses are required to furnish personal professional liability insurance.

6. All pharmacy elective courses are acceptable for option credit. Faculty advisers will provide information on any non-pharmacy elective courses which are acceptable.



School of Veterinary Medicine

J. E. GREENE, *Dean*

NELSON KING, *Associate Dean*

H. C. MORGAN, *Assistant Dean*

THE SCHOOL OF VETERINARY MEDICINE offers a fully accredited program of training leading to the degree of Doctor of Veterinary Medicine. The curriculum requires four years in the professional school after completion of at least seven quarters of the pre-professional course.

Admissions

Seven quarters of general college work with a minimum grade-point average of 1.25 on a 3.00 system on all attempted and on all required courses, are essential for admission. A grade of D on any required course will not be accepted. In addition, the Committee on Admissions of the School of Veterinary Medicine may require a personal interview, a reading comprehension test, or an examination on any required course. The School of Arts and Sciences and the School of Agriculture offer Pre-Veterinary curricula which are available only to residents of Alabama. Although farm experience and work with veterinarians are not requirements for admission, applicants are urged to gain such training. Students without this experience frequently have difficulty with certain courses, particularly in the clinical areas.

Application for admission to either pre-veterinary curriculum should be made directly to the Admissions Office, Auburn University. Counseling of pre-veterinary students is the responsibility of the School of Arts and Sciences except for the program in the school of Veterinary Medicine.

Minimum Requirements for Pre-Veterinary Medicine

1. COMPLETION OF THE LIBERAL EDUCATION PROGRAM as stated on page 12 of this bulletin.

2. SPECIFIC COURSE REQUIREMENTS: Minimum pre-veterinary requirements for Alabama residents are exactly as listed for the first seven quarters of the pre-veterinary curriculum on page 92. The program in the School of Agriculture has the same courses, but they are distributed over nine quarters. Applicants from states participating under the Southern Regional Education Board (SREB) must take acceptable equivalents which have been approved by the appropriate state advisers.

3. ALL TRANSFER COURSES must be equivalent in hours and content. CLEP substitutions are acceptable as stated in this catalog. Courses will not be waived on the basis of degrees or "practical experience." Pass-Fail or

Satisfactory-Unsatisfactory grades are not acceptable in required courses. Consideration will not be extended to anyone with an overall or required course grade point average of less than 1.25 at the time of application.

4. **TIME LIMITATION:** All required courses in the advanced physical and biological science categories must have been completed within six calendar years prior to the anticipated date of enrollment in the School of Veterinary Medicine.

5. **AGE:** The Committee sets no age limit on entering students, but priority decreases in relation to the diminishing number of productive years following graduation. The preferred age for applicants is 20-28 years. Only in exceptional circumstances will applicants older than 30 years be considered for admission.

Application Procedure

Admission of Alabama residents to the School of Veterinary Medicine must be gained through formal application made between January 15 and February 15 preceding the Fall Quarter in which admission is desired. The length of residence of Alabama applicants shall be a factor. Residents of other states should consult their advisers for exact application dates.

Applicants should submit the following:

1. Two completed application for-admission forms* supplied by the School of Veterinary Medicine.
2. Two official transcripts* from each college or university attended.
3. A list of courses in progress at time of application, if any.
4. Application fee—\$10.00 (not applicable if previously enrolled at Auburn University).

If a student is admitted to the School of Veterinary Medicine, he must submit one completed physical examination report on a form supplied by Auburn University at least three weeks prior to date of registration (not required by students formerly enrolled at Auburn University) and two supplemental official transcripts of any work completed after application is filed.

The final selection of students is made by the Committee on Admissions of the School of Veterinary Medicine, Auburn University. These selections are made from the applicants who have been certified by the committees in the respective states after giving due consideration to scholastic record and general adaptability for the profession. The right is reserved to accept or reject any applicant. All applications for admission must be on file at the School of Veterinary Medicine by February 15 preceding date of admission.

MICROSCOPES—In order to be admitted to the School of Veterinary Medicine, a student must own a compound microscope acceptable to the faculty. The student must furnish a microscope in all courses requiring the use of this instrument.

ADMISSION UNDER THE REGIONAL PLAN—Under the Regional Plan for Veterinary Training, the School of Veterinary Medicine serves four states: Alabama, Kentucky, Mississippi, and North Carolina.

*Only one is required of students formerly enrolled at Auburn University.

The Land-Grant institution in each state participating under the Southern Regional Education plan maintains counseling and guidance service for students desiring admission to the School of Veterinary Medicine. Students attending other institutions should contact the Land-Grant School advisers in their state for information concerning admission requirements.

Scholastic Requirements

All applicants and students in the professional program are subject to the academic and disciplinary regulations of the School of Veterinary Medicine in addition to those of Auburn University.

Any student who earns less than a 1.25 grade-point average for any quarter will be placed on academic probation. A student who fails to earn a 1.25 grade-point average for any two quarters in the same academic or calendar year may be dropped from the rolls of the School of Veterinary Medicine for scholastic deficiency. In addition, a student who does not have an overall average of 1.25 for an academic year or who does not have a veterinary school cumulative average of 1.25 at the end of any academic year may be required to withdraw from the School of Veterinary Medicine.

A student who makes a grade of F on any course may be required to withdraw from the School of Veterinary Medicine until such time as the course is offered again. Such student may be required to repeat certain other courses in the curriculum for that quarter.

Clinical courses are unique in that the art and skills to be developed in them can only be acquired by full participation in the laboratories. The attendance in these courses is required except in case of illness or other extenuating circumstances as may be judged by the involved instructor. The grading in these clinical laboratory courses is primarily by subjective evaluation. When a course involves student rotation through several disciplines or sections, the student must receive a passing grade in each area before a passing grade can be given for the course.

The responsibility for counseling is shared by the Faculty of this School and the University Counseling Service.

Required Withdrawal

The faculty of the School of Veterinary Medicine reserves the right to require the withdrawal at any time of any student who in the judgment of the admissions committee is not profiting from the instruction offered, who is neglectful, irregular or indifferent in the performance of required duties and studies, or whose character or conduct is inconsistent with good order of the veterinary school or with the standard of the veterinary profession.

Requirements for Graduation

To be eligible for the D.V.M. degree, candidates must complete all of the required courses in the order listed in the curriculum in veterinary medicine with a minimum overall grade-point average of 1.25. Following completion of all academic work, each student will be required to serve a preceptorship of

one quarter with a reputable practicing veterinarian. A certificate of satisfactory completion of a preceptorship will be required for graduation.

A graduation fee of \$10.00 must be paid at the beginning of the quarter of graduation and all indebtedness due the institution must be paid prior to graduation.

Curriculum in Veterinary Medicine (VM)

FIRST YEAR

Second Quarter

Third Quarter

VM 320	Anatomy I.....5	VM 321	Anatomy II.....5	VM 322	Anatomy III.....5
VM 326	Histology.....5	VM 327	Organology.....5	VM 328	Embryology.....4
VM 313	Physiology I.....3	VM 315	Physiology III.....2	VM 318	Physiology VI.....4
VM 314	Physiology II.....3	VM 316	Physiology IV.....2	VM 331	Vet. Micro. I.....4
VM 300	Orientation.....2	VM 317	Physiology V.....2	VM 319	Pharmacology I.....2
VM 313	Physiology Lab. I.....1	VM 315	Physiology Lab. II.....2	VM 318L	Physiology Lab. III.....1

SECOND YEAR

VM 405	Pathology I.....6	VM 406	Pathology II.....5	PH 422	Avian Diseases.....5
VM 403	Physiology VII.....4	VM 410	Vet. Parasitol. II.....5	VM 414	Vet. Med. I.....5
VM 409	Vet. Parasitology I.....4	VM 402	Pharmacology III.....4	VM 407	Pathology III.....4
VM 411	Vet. Micro. II.....6	VM 412	Vet. Micro. III.....5	VM 413	Public Health I.....4
VM 401	Pharmacology II.....3	VM 404	Physiology VIII.....3	VM 408	Lab. An. Md. ....3
				VM 460	Clinic Elective.....1-2*

THIRD YEAR

VM 420	Vet. Med. II.....5	VM 425	Vet. Med. & Surg. II.....5	VM 435	Theriogenology.....4
VM 424	Vet. Med. & Surg. I.....3	VM 438	Vet. Med. IV.....4	VM 440	Clinics VII.....6
VM 421	Vet. Surg. I.....3	VM 451	Public Health II.....2	VM 444	Clinics II.....6
VM 427	Vet. Med. & Surg. III.....3	VM 423	Clinical Path. ....4	VM 448	Vet. Surg. IV.....1
VM 431	Vet. Radiology.....3	VM 422	Vet. Surg. II.....3	VM 453	Seminar.....2
VM 428	Diag. Clinics I.....1	VM 434	Applied Anatomy.....1		Electives.....2
VM 429	Clinics VI.....2	VM 426	Vet. Surg. III.....1		
VM 460	Clinic Elective.....1-2*	VM 433	Ther. Clinics.....1		

FOURTH YEAR

VM 437	Vet. Med. III.....5	VM 442	Clinics IX.....6	VM 443	Clinics X.....6
VM 441	Clinics VIII.....6	VM 446	Clinics IV.....6	VM 447	Clinics V.....6
VM 445	Clinics III.....6	VM 453	Seminar.....2	VM 430	Jurisp. & Ethics.....2
VM 449	Vet. Surg. V.....1	VM 439	Vet. Med. V.....5	VM 452	Public Health III.....2
VM 453	Seminar.....2	VM 450	Vet. Surg. VI.....1	VM 453	Seminar.....2
	Electives.....2		Electives.....2		Electives.....2

Spring Quarter

VM 454	Preceptorship.....0
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Electives—See under Veterinary Medical course description.

*Optional elective.

TOTAL—241 QUARTER HOURS

The Graduate School

PAUL PARKS, *Dean*

HUGH DONNAN, *Assistant Dean*

DON RICHARDSON, *Assistant Dean*

ALL REGULATIONS governing the Graduate School are designed to equal or exceed the minimum standards recommended by the College Delegate Assembly of the Southern Association of Colleges and Schools.

A student with a bachelor's degree from an accredited college or university may apply to the Dean of the Graduate School for admission. Application forms for admission may be secured from the Graduate School and must be submitted at least three weeks before registration.

The *Graduate School Bulletin* should be consulted for detailed information on the regulations of the Graduate School, the courses offered for graduate credit, the requirements for degrees, fellowships and assistantships, and other matters pertaining to graduate work in this institution. Undergraduates wishing to register for graduate courses should consult the *Graduate Bulletin* for regulations concerning such registration. A bulletin may be obtained upon request from the Dean of the Graduate School.

The Graduate School administers graduate work leading to the degrees listed below.

Graduate Degrees

The Master's Program

Master of Science in the areas of Aerospace Engineering; Agricultural Economics and Rural Sociology; Agricultural Engineering; Agronomy and Soils; Anatomy and Histology; Animal and Dairy Sciences; Botany and Microbiology; Business; Chemical Engineering; Chemistry; Civil Engineering; Consumer Affairs; Counselor Education; Economics; Educational Administration; Educational Media; Electrical Engineering; Elementary Education; Entomology; Family and Child Development; Fisheries and Allied Aquacultures; Forestry; Health, Physical Education and Recreation; Horticulture; Industrial Engineering; Large Animal Surgery and Medicine; Mathematics; Mechanical Engineering; Microbiology; Nuclear Science; Nutrition; Nutrition and Foods; Ornamental Horticulture; Pathology and Parasitology; Pharmacy; Physics; Physiology and Pharmacology; Poultry Science; Psychology; Secondary Education; Small Animal Surgery and Medicine; Sociology; Toxicology; Vocational and Adult Education; Wildlife Management; and Zoology.

Master of Arts in the areas of English; French; History; Political Science; Sociology; Spanish; and Speech Communication.

Other Master's Degrees: Master of Agriculture, Master of Arts in College Teaching, Master of Business Administration, Master of Education, Master of Electrical Engineering, Master of Fine Arts, Master of French Studies, Master

of Hispanic Studies, Master of Industrial Design, Master of Industrial Engineering, Master of Mechanical Engineering, Master of Music, Master of Speech Communication.

The Doctoral Degree Program

The degree of Doctor of Education is offered with specializations in Administration and Supervision, Counselor Education, Elementary Education, Secondary Education, and Vocational and Adult Education.

Doctor of Philosophy in the Departments of Aerospace Engineering, Agronomy and Soils, Animal and Dairy Sciences, Botany and Microbiology, Chemical Engineering, Chemistry, Electrical Engineering, English, Fisheries and Allied Aquacultures, Forestry, History, Industrial Engineering, Mathematics, Mechanical Engineering, Physics, Psychology, Wildlife Management, and Zoology-Entomology, and interdepartmental programs in Agricultural Engineering, Microbiology, Nutrition, and Physiology.

Research Program with the Oak Ridge Associated Universities

Auburn University is one of the sponsoring institutions of the Oak Ridge Associated Universities research program located at Oak Ridge, Tennessee. Through this cooperative association Auburn's graduate research programs have at their disposal the facilities of the National Laboratories in Oak Ridge and the research staffs of these laboratories. Both faculty and students may keep abreast of the most modern and up-to-date developments in atomic and nuclear research that is in progress at the Oak Ridge Laboratories.

Information on the opportunities for research in the Oak Ridge Laboratories is available in the office of the Dean of the Graduate School.

Interdepartmental and Interdisciplinary Curricula

Undergraduate

Environmental Health (ENH)

THE CURRICULUM in Environmental Health is an interdepartmental program administered by a faculty committee from the Schools of Agriculture, Education, Engineering, Home Economics and Pharmacy and is based on the strengths of Auburn University in the biological and physical sciences.

Environmental health specialists are employed by industries, consultants, trade associations, and by governmental agencies to work in areas such as food sanitation, water supply sanitation, refuse and waste control, air pollution control, and, institutional sanitation.

The program leading to a Bachelor of Science degree is designed to prepare graduates for careers in the broad field of environmental health. Interested students should contact Dr. J. F. Judkins, in the Civil Engineering Department for further details concerning the program.

Curriculum in Environmental Health

FRESHMAN YEAR								
First Quarter			Second Quarter					
CH 103	Fund. Chem. & Lab.	5	CH 104	Fund. Chem. & Lab.	5	BI 101	Prin. Biol.	5
MH 160	Pre-Cal. w. Trig.	5	MH 161	An. Geom. & Cal.	5	EH 103	English Comp.	3
EH 101	English Comp.	3	EH 102	English Comp.	3	HY 206	Tech. & Civiliz.	3
HY 204	Tech. & Civiliz.	3	HY 205	Tech. & Civiliz.	3	PG 212	Psychology	3
	Basic ROTC or PE	1		Basic ROTC or PE	1	NF 112	Nutrition & Man.	3
							Basic ROTC or PE	1
SOPHOMORE YEAR								
BI 104	Biol. Human Affrs.	5	EC 200	Economics I	5	AM 304	Meteorology	5
SY 201	Intr. Socio.	5	PS 205	Physics	5	PS 206	Physics	5
CH 203	Org. Chem.	5	SC 202	App. Sp. Comm.	3	RSY 362	Comm. Organiz.	5
EH 260	Lit. of Western World	3	EH 261	Lit. of Western World	3	EH 262	Lit. of Western World	3
JUNIOR YEAR								
PY 428	Public Health	5	BY 300	Gen. Microbiology	5	MN 344	Envir. Law	5
ZY 250	Human Anat.	5	ZY 251	Physiology	5	NF 318	Nut. Biochem	5
NF 362	Comm. Nutrition	3	EH 304	Tech. Writing	3	BY 302	Med. Microbiology	5
	Prof. Elective	5		Prof. Elective	3		Prof. Elective	3
Summer Independent Study*						3-5		
SENIOR YEAR								
IE 438	Safety Engr.	5	BY 441	Sanitary Microbiol.	5	BY 401	Biol. Statistics	5
	Prof. Elective	8	ADS 415	Food Plant Sanitat	3	CE 409	Envir. Health Engr.	5
PY 432	Fund of Bionucleonics	3	CE 424	Air Pollution	3	CA 431	Man-Envir. Rel.	2
				Prof. Elective	5		Prof. Elective	5

TOTAL—208 QUARTER HOURS

*An area of particular interest to the individual student can be selected for independent study, i.e. ADS 490, BY 460, CE 490, NF 408, PY 413, etc.

Graduate

Interdepartmental Programs

The Graduate School offers four interdepartmental programs. These are in Microbiology, Nutrition, Physiology, and Sociology. The programs in Microbiology, Nutrition, and Physiology lead to the Doctor of Philosophy degree. Students in the Sociology program may earn the Master of Arts, Master of Science, and Master of Arts in College Teaching degrees. Students in Nutrition may also earn the Master of Science degree. These programs are supervised by coordinating committees appointed by the Dean of the Graduate School. Departments cooperating in the Microbiology program are: Agronomy and Soils, Animal and Dairy Sciences, Botany and Microbiology, Civil Engineering, Poultry Science, Veterinary Microbiology, Veterinary Pathology and Parasitology, and Zoology-Entomology. Departments and schools cooperating in the Nutrition program are: Animal and Dairy Sciences, Fisheries and Allied Aquacultures, Nutrition and Foods, and the School of Veterinary Medicine. The faculty and students in Physiology are drawn from the departments of Animal and Dairy Sciences, Chemistry, Physics, Poultry Science, Psychology, Veterinary Physiology and Pharmacology, Veterinary Anatomy and Histology, and Zoology-Entomology. The departments of Sociology and Anthropology, Agricultural Economics and Rural Sociology, and Foundations of Education are the cooperating departments in Sociology.

Interdisciplinary Program

The graduate program in Agricultural Engineering, leading to the Ph.D. degree, is an interdisciplinary program open to all students with undergraduate training in engineering equivalent to a B.S. degree.

The program is administered by a committee composed of representatives from the departments of Physics, Mathematics, the Assistant Dean of Engineering, the Dean of Agriculture and the Head of the Department of Agricultural Engineering. This committee screens all doctoral candidates and their programs of study.

Students may pursue majors or minors in selected engineering disciplines having agricultural engineering applications.

Students wishing additional information on these programs should consult *The Graduate School Bulletin*.

Reserve Officers Training Corps

DEPARTMENT OF MILITARY SCIENCE

COLONEL AWBREY G. NORRIS
Professor of Military Science

STUDY OF MILITARY SCIENCE at Auburn University dates back to the Civil War period. The Morrill Land Grant Act of 1862 requires that military instruction be furnished to students. Military Science instruction leading toward an Army commission is available to both male and female students. The curriculum in Military Science is divided into two courses, basic and advanced. A description of course requirements is discussed in the following paragraphs.

Basic Course

The basic course consists of a six-quarter block of instruction normally taken during the freshman and sophomore years. During the freshman year, two hours of instruction (one classroom and one leadership lab) are taken each week for three quarters.

In the sophomore year three hours of instruction (two classroom and one leadership lab) are taken each week for three quarters. All freshman and sophomore military science classes are offered Fall, Winter and Spring Quarters, with one credit hour being allowed each quarter.

In lieu of the basic course interested students may attend the basic camp. This is normally accomplished between the sophomore and junior years. The basic camp consists of six weeks of field training conducted at an Army Post during the summer.

Advanced Course

The Advanced Course is designed to produce officers for the Army of the United States, both the Active Army and the Reserve. Successful completion of the Advanced Course at Auburn University qualifies the student for a commission as 2nd Lieutenant in the United States Army Reserve. Students who are designated Distinguished Military Students may apply for a Regular Army commission, if accomplished prior to graduation. Regular Army appointments are contingent upon selection by Department of Army and subsequent designation of the cadet as a Distinguished Military Graduate. The advanced course consists of a six-quarter course, normally taken during the junior and senior years, designed to qualify the student for appointment in the United States Army Reserve. Three credit hours per quarter or a total of 18 credit hours are granted for completion of the Advanced Course; however, only 12 credit hours may apply toward total credits required for graduation. Students are paid subsistence pay of \$100.00 per month, not to exceed 600 days while enrolled in the Advanced Course.

An advanced camp of six weeks duration must be attended by the student before becoming eligible for a commission. Advanced camp is normally attended during the summer between the end of the junior and the start of the

senior years. While attending advanced camp students are paid $\frac{1}{2}$ base pay of a second lieutenant (approximately \$500.00 for six weeks). Reimbursement to the students for travel expenses is made at a rate of six cents per mile to and from camp. Uniforms, quarters, medical care and rations are furnished by the government during the camp period.

Financial Assistance Program

The Army ROTC offers a scholarship program designed to provide financial assistance to outstanding men and women in the program who are interested in the Army as a career. Each scholarship provides for free tuition, textbooks and laboratory fees in addition to pay of \$100.00 per month for the period that the scholarship is in effect.

Scholarships may be awarded for periods of one, two, three or four years. Four year scholarships are awarded to selected high school applicants who plan to attend a University offering Army ROTC in its curricula.

Three and two year scholarships are awarded to selected applicants enrolled in freshmen and sophomore military science who are qualified to enter the advanced program.

Recipients of Army ROTC scholarships agree to serve on active duty as a commissioned officer for a four year period. The remainder of the normal six year service obligation may be spent in an Army Reserve Component.

DEPARTMENT OF NAVAL SCIENCE

COLONEL J. W. DUNCAN, USMC

Commanding Officer and Professor of Naval Science

The purpose of NROTC is to provide well-educated junior officers for the regular Navy and Marine Corps and to build up a reserve of trained officers for service in a national emergency. All NROTC programs are open to eligible women students.

TYPES OF NROTC STUDENTS

Students in the NROTC are of three types:

1. NROTC Navy-Marine Scholarship Program. Successful completion of this program leads to a commission in the regular Navy-Marine Corps and service at the pleasure of the President. The minimum active duty service is four years.

Tuition, fees, and textbooks for these students will be paid for by the Government. Students receive subsistence pay of \$100 per month for a maximum of 40 months. Active duty pay for summer training is approximately \$300 per month at present.

Students may take most Auburn University majors leading to a baccalaureate degree with some exceptions. These will be considered on an individual basis by the Commanding Officer prior to appointment.

In addition to the requirements of their major, NROTC students are required to complete 30 quarter hours of Naval Science. Summer quarters are

occupied with two at-sea training cruises and one summer period of aviation-amphibious indoctrination, lasting from six to eight weeks each.

Entrance to the Navy-Marine Scholarship Program is effected through nation-wide competition. Applicants must make independent arrangements to take either the Scholastic Aptitude Test or the American College Test at their own expense.

Scholarship students may resign without prejudice at any time prior to the beginning of their third year in the Program.

2. Four-Year NROTC Navy-Marine College Program. These students may become commissioned officers in the Navy or Marine Corps Reserve. They are entitled to subsistence pay of \$100 per month for a maximum of 20 months during their final two years of NROTC training, and summer cruise compensation. They are required to serve on active duty for three years and retain their commission for a total of six years from date of appointment, unless sooner released by the Secretary of the Navy. These students are selected by the Professor of Naval Science.

Students in the four-year program who have not yet received the \$100 per month subsistence payments may resign from the NROTC Program without prejudice.

3. Two-Year NROTC Navy-Marine College Program. Selections for this program are made on a national basis from nominations submitted by the Professors of Naval Science. Selected applicants will attend a Naval Science Institute of six weeks duration during the summer prior to their junior year. Successful completion of the Naval Science Institute will qualify these students for enrollment in the advance course in the NROTC College Program.

Students in both the latter programs may apply for the Scholarship Program through national competition, or for Professor of Naval Science nomination for appointment as Scholarship students.

The student must complete all Naval Science requirements prior to or concurrently with receipt of a baccalaureate degree. Summer training consists of an at-sea training cruise between the junior and senior years.

Qualifications for enrollment, application blanks and information bulletins are available each Fall at high schools, colleges, Recruiting Stations, and the NROTC Unit.

Equipment

Uniforms, Naval Science textbooks, and equipment necessary to the NROTC Program are furnished in all programs.

Curriculum

Naval Science curriculum consists of the following hours per week: freshman and sophomore Naval Science courses and Marine Corps option courses, four hours; junior and senior courses, five hours.

Naval Science subjects carried during the four-year curriculum are listed in the Description of Courses section of this Bulletin. Only the 300/400 series subjects are applicable to the Two-Year College Program.

Freshman, sophomore, and Marine Corps option courses carry two quarter hours of credit and the junior and senior courses carry three quarter hours of credit. These hours of credit will be considered as a part of the normal quarterly load; however Auburn University graduation requirements will be increased by 12 to 18 hours, depending upon the school in which enrolled, over the number of hours listed in the University catalog.

Navy-Specified University Courses

All students are required to take Naval History and National Security and Foreign Policy. Navy option students must also take courses in calculus, physics and computer science. College Program students may substitute chemistry, biology, zoology or geology for physics, and statistics for calculus.

Flight Instruction Program

A Flight Instruction Program at government expense is offered to qualified students in advanced training.

DEPARTMENT OF AIR FORCE AEROSPACE STUDIES (AFROTC)

COLONEL ROBERT E. HALL

Professor of Air Force Aerospace Studies and Commander

AFROTC is the nation's largest source of Air Force Officers. It supplements a student's chosen academic major and provides a basic understanding of the role of air power and management of the Air Force. Enrollment in the General Military Course is open to all freshmen and sophomore men and women and does not require a military commitment. The Professional Officer Course is open to qualified men and women and leads directly to an Air Force commission.

General Military Course (Basic Course)

The General Military Course is composed of one class hour and one Leadership Laboratory hour per week. One credit hour is allowed for each quarter of the six quarter basic course. Leadership Laboratory extends beyond drill and ceremonies to include briefings by various Air Force commands and staff agencies and related corps projects. Students are provided the opportunity to visit various Air Force bases to acquaint them with operational Air Force units.

Field Training

Applicants for the Professional Officers Course attend a summer Field Training Course between their sophomore and junior years. Students who have completed the GMC are assigned to a four-week training unit and those

who did not take the GMC are assigned to a more intensive six-week course. The Air Force furnishes uniforms, housing, medical care, rations, a round trip travel allowance and military pay.

Professional Officer Course (Advanced Course)

The Professional Officer Course consists of a six-quarter course normally taken during the junior and senior year. Enrollment in the advanced course is also open to graduate students if they have six-quarters of school remaining. Three classroom hours of instruction and one hour of Corps Training are taken per week. Three credit hours per quarter or a total of 18 credit hours are granted for completion of the Professional Officer Course; however, only six to 12 credit hours may be applied towards the total credits required for graduation. Students enrolled in the program are given a monthly subsistence allowance and those selected for the pilot category are eligible for the Flight Instruction Program.

Uniforms and Equipment

All students enrolled in the AFROTC program must deposit \$30.00 with the University Bursar. One dollar and fifty cents is then withheld each quarter by the Bursar to cover the cost of cleaning and repair of the uniforms. After payment of the deposit, students are issued the necessary texts and uniform items through the AFROTC Supply Office. The deposit, less the amount withheld each quarter, is returned upon a student's withdrawal.

College Scholarship Program

Four year, three year and two year scholarships are available for male and female students who qualify. Scholarships cover full tuition, laboratory expenses and incidental fees to include textbooks, a monthly stipend and all uniform items. Scholarships are awarded to qualified students based on application to, and selection by central selection boards.

Flight Instruction Program

The Flight Instruction Program is conducted during the cadet's last year in AFROTC and provides the pilot category cadets with 25 hours of flight training and an Air Force conducted ground school. The primary purpose of this training is to determine a cadet's aptitude for flying and to motivate him toward a career as an Air Force pilot. The Flight Training, provided by Auburn University at no expense to the student, is conducted under a contract with the Air Force, and is monitored by the FAA.



Courses of Instruction

In this section are listed and described all courses taught by the departments of the University. The courses are presented by subjects, arranged alphabetically. The subject name (the heading in large type) is followed by the departmental symbol in parentheses. Below the subject appears a list of the departmental faculty.

The subject name (symbol) together with the course number constitutes the official designation for the course for purposes of registration and official records. The specific course title appears in boldface following the course number. The figures in parentheses denote the number of quarter hours of credit for the course. Following the credit hours are listed lecture and laboratory clock hours, if applicable. If none is listed, the course consists of lecture hours equal in number to course credit. Next appear the prerequisites, if applicable.

Courses are numbered according to the following system:

- 101-199** Courses primarily for freshmen.
- 201-299** Courses primarily for sophomores.
- 301-399** Courses primarily for juniors.
- 401-499** Courses primarily for seniors. Not open to graduate students.
- 501-599** Courses for advanced undergraduate and graduate students; and for fifth year students in professional curricula. Junior standing required for enrollment at this level.
- 601-799** Courses for graduate students

INDEX BY FIELDS OF INSTRUCTION

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Architecture (AR)	199	Engineering (EGR)	257
Art (AT)	204	English (EH)	257
Aviation Management (AM)	207	Environmental Health	261
Biology (BI)	209	Family and Child Development (FCD)	261
Botany and Microbiology (BY)	210	Fisheries and Allied Aquacultures (FAA)	264
Building Science (BSC)	213	Food Science (FS)	266
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Geography (GY)	275	Pathology and Parasitology (VPP)	351
Geology (GL)	276	Pharmacy (PY)	311
Health, Physical Education and Recreation (HPR)	240	Philosophy (PA)	315
History (HY)	277	Physical Science (PHS)	317
Horticulture (HF)	281	Physics (PS)	317
Industrial Engineering (IE)	283	Physiology and Pharmacology (VPH)	352
Interdepartmental Education (IED)	245	Political Science (PO)	321
Journalism (JM)	288	Poultry Science (PH)	325
Laboratory Technology (LT)	289	Psychology (PG)	326
Large Animal Surgery and Medicine (VLA)	350	Religion (RL)	329
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Marketing and Transportation (MT)	292	Social Work (SW)	334
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University Courses (U)

The following courses, interdisciplinary and experimental in character, are designed to enable the student to see in a wide perspective the relationship of individual courses in his curriculum and to understand more fully the dominant ideas and concepts confronting him in the modern world. University Courses are open to students in all curricula.

190. Theory and Practicum in Collegiate Sports (1).

Conditioning activities in preparation for competitive football. Skills and fundamental techniques of physical activities related to football. Coaching techniques applicable to all areas of athletic competition.

200. Frontiers of Behavior (3). Pr., sophomore standing.

Analyses of current behavioral topics with special emphasis upon social issues important to college age students. Administered by Department of Psychology.

201. Forum (1). May be taken more than one quarter for a maximum of 3 credits. S-U only.

Credit is given in recognition of significant attendance at public academic lectures, concerts, and other events. Requires attendance at seven of the 15-20 FORUM-designated events, which are chosen from various University lecture and concert series and departmental programs. Administered by Department of Philosophy.

210. The Nature of Materials for Living (5). Lec. 4, Lab. 1. Pr., sophomore standing.

The structures and properties of the principal classes of useful materials are described in relation to their applications. Topics will include metals, ceramics, plastics, compatibility, durability, and appearance as related to consumer goods, housing, and environment. The laboratory will include related films, demonstrations, and tests performed by students. Administered by Department of Mechanical Engineering.

275. Interpersonal Relations (3).

A multi-disciplinary study of methods used by human beings in their interactions that tend to be mutually rewarding. Emphasis is on practical applications within the context of the student's present fields of study and projected fields of work.

301. The Meaning of Environmental Quality (3). Pr., junior standing or consent of instructor.

Faculty discussion leaders representing engineering agriculture, humanities, social and biological sciences, art and architecture, planning, etc., will present materials from their professional disciplinary perspectives. Discussions will aid student understanding of the problem, potential solutions and their implications for mankind. Administered by Department of Civil Engineering.

- 305. The Model United Nations (1).** May be taken more than one quarter for a maximum of 3 credits. S-U only.
Preparation of materials for, and active participation in, the sessions of the Model United Nations program held annually on the campus. Administered by Department of Political Science.
- 310. Our Man-Made World (5).** Pr., junior standing or consent of instructor.
How the techniques and theories of modern technology attempt to deal with the problems of our society and environment. Administered by Department of Zoology-Entomology.
- 315. Forces and Motion (3).** Pr., MH 140 or equivalent or consent of instructor.
Basic ideas of mechanics in terms of contemporary machines and mechanisms. Subject matter is presented in a verbal but technically correct style, using the language and art of engineering. Administered by Department of Mechanical Engineering.
- 316. Energy and Power (3).** Pr., MH 140 or equivalent or consent of instructor.
Energy sources and transfer in engines, machines and power systems. Operation and efficiencies of work absorbing and work producing machines and their relationship to the energy crisis. Consideration of thermal and air pollution and its control. Administered by Department of Electrical Engineering.
- 317. Materials and Recycling (3).** Pr., MH 140 or equivalent or consent of instructor.
Structure and properties of matter and their interrelationships in materials commonly used and how they may be recycled to conserve resources. Accomplishing conservation is emphasized. Administered by Department of Mechanical Engineering.
- 320. Computers and Society (3).** Primarily for students with no prior computer experience.
Presents the basic concepts of computers, their capabilities and their limitations, the effects, good and bad, of the computer on man, including the computer's influence on automation, privacy, individuality, and power, as well as means of controlling the use of computers in both public and private sectors. Administered by Department of Industrial Engineering.
- 380. Electric Energy and Man (3).** Pr., junior standing.
Problems associated with the production, transmission, and utilization of electrical energy. Comparison of tidal, solar, fossil fuel, nuclear, hydro, and geothermal energy sources. Ecological and economical considerations. Administered by Department of Electrical Engineering.
- 399. Experiential Learning (2-6).** Pr., sophomore standing and consent of instructor. May be repeated once for credit.
Students may obtain academic credit for participation in learning experiences of a practical nature available outside the normal curricular offerings of the University.
- 400. Psychological Study of the Community (3).** Lec. 2, Lab. 2. Pr., consent of instructor, junior standing.
Local community programs designed to foster interest in and an understanding of our society. A number of community leaders will be used as speakers and discussion leaders. Administered by Department of Psychology.
- 401. Introduction to Planning (3).** Pr., consent of instructor, junior standing.
A critical examination of the processes by which cities and regions are planned and developed, with emphasis placed on urban areas, and of the influences of technical and social change. Credit not allowed toward graduate work in urban and regional planning.
- 422. Natural Philosophy (3).** Pr., junior standing.
A synthesis of modern thought concerning the unifying ideas of physical and biological sciences and their impact on the social-economic structure of man-made society. Contributions from various sciences are evaluated in light of knowledge of the last part of the twentieth century. Administered by Department of Chemistry.

Accounting and Finance (ACF)

Professors Robinson, *Head*, Hartman, and Hill

Associate Professors Criss, Hale, Hand, Lindbeck, Miley, and Thorne

Assistant Professors Angell, Beard, Becker, Davis, Dinius, Edmonds, Glover, McCord, Rogow, Tole, and Williams

Instructors Crittendon and Rose

Accounting

- 211. Principles of Accounting I (4).** Lec. 3, Lab. 2. Pr., sophomore standing.
Basic accounting principles, including the accounting cycle and preparation of financial statements. ACF 211 is not open to students with credit in ACF 215.
- 212. Principles of Accounting II (4).** Lec. 3, Lab. 2. Pr., ACF 211.
A continuation of accounting principles with emphasis on their application to partnerships, corporations, and preparation and analysis of various financial statements.
- 215. Fundamentals of General and Cost Accounting (5).** Lec. 3, Lab. 4. Pr., sophomore standing.
The fundamental concepts and principles of general and cost accounting with emphasis on accumulating, reporting, and interpreting cost data in the production area of business operations. (Not open to undergraduates majoring in B.A. Credit in ACF 211 precludes credit for ACF 215.)

- 310. Managerial Cost and Budgeting (5). Lec. 3, Lab. 4. Pr., ACF 212.**
The third course for accounting majors or a terminal course for non-accounting majors. Introductory cost accounting and budgeting with some emphasis on distribution costs and managerial accounting problems. ACF 310 and 311 may be taken independently or concurrently; both are prerequisites for ACF 312.
- 311. Intermediate Accounting I (5). Lec. 3, Lab. 4. Pr., ACF 212.**
Accounting principles and theory, including a review of the accounting cycle and accounting for current assets, current liabilities, and investments. ACF 310 and 311 may be taken independently or concurrently; both are prerequisites for ACF 312.
- 312. Intermediate Accounting II (5). Lec. 3, Lab. 4. Pr., ACF 310 and 311.**
A continuation of accounting principles and theory with emphasis on accounting for fixed assets, intangibles, long term liabilities, corporate capital structure, analysis of financial statements and funds flow.
- 314. Income Tax Accounting (5). Pr., ACF 312.**
Interpretation of the regulations, preparation of returns, and the keeping of accounting records for tax purposes.
- 410. Cost Accounting (5). Lec. 3, Lab. 4. Pr., ACF 312, junior standing.**
Accounting principles and procedures involved in job-lot, process, and standard cost accounting.
- 414. Advanced Income Tax Accounting (5). Pr., ACF 312, 314, junior standing.**
Special tax accounting problems of individuals, partnerships, corporations, estates, and trusts. Extensive use will be made of a tax service program.
- 415. Business Information and Accounting Systems (5). Pr., ACF 312, senior standing.**
The design, installation, operation, and interrelationship of accounting systems which constitute the information flows and provide the basis for financial decisions in modern organizations.
- 416. Auditing (5). Pr., ACF 312, senior standing.**
The principles of auditing with particular attention to methods of testing, analyzing, and summarizing accounting records.
- 417. Advanced Accounting (5). Lec. 3, Lab. 4. Pr., ACF 312, junior standing.**
Specialized accounting problems, including partnerships, joint ventures, installment sales, consignments, receiverships, and estates and trusts.
- 418. Accounting for Business Combinations (5). Lec. 3, Lab. 4. Pr., ACF 312, junior standing.**
Accounting for home and branch office procedures, business combinations, parent and subsidiary operations, and preparation of consolidated statements.
- 419. Governmental Accounting (5). Pr., ACF 312 or ACF 312 concurrently, junior standing.**
Budgeting and accounting procedures of governmental divisions.
- 490. Special Problems. (1-10). Pr., ACF 312, senior standing.**
Advanced individual research and study of accounting and finance under guidance of a faculty member.
- 491. Veterinary Business Methods (3). Lec. 3, Lab. 1. Pr., 4th yr. Summer.**
Various aspects of business methods and legal concerns in starting a veterinary practice. Emphasis on accounting systems, record keeping procedures and taxation.
- 499. Seminar in Current Accounting Topics (1). Pr., graduating seniors.**
Study and discussion of the current literature, problems, and controversies affecting the accounting profession.

ADVANCED UNDERGRADUATE AND GRADUATE

- 513. Foundations in Accounting for Management (5). Pr., Consent of the Director of Graduate Studies, School of Business.**
An accelerated course in accounting fundamentals and business applications.

GRADUATE

- 610. Managerial Accounting (5). Pr., ACF 212 or 513, graduate standing or consent of instructor.**
Primarily non-technical, for the student who will be confronted with business problems requiring a comprehensive understanding of accounting concepts, and the accepted methods of applying these concepts in decision-making, planning, and control.
- 611. Advanced Accounting Theory (5). Pr., ACF 312, graduate standing or consent of instructor.**
A review of the origin and development of double-entry accounting; followed by a critical study of the theory of modern accounting principles and procedures.
- 614. Financial Information Systems (5). Pr., graduate standing or consent of instructor.**
Identification, evaluation, and modification of critical information flows into efficient and effective information systems to service modern management decision needs.

- 616. Advanced Auditing (5). Pr., ACF 416, graduate standing or consent of instructor.**
Application of auditing principles and procedures to practical problems encountered in the field of public and private accounting.
- 617. Advanced Accounting Problems (5). Pr., ACF 417, graduate standing or consent of instructor.**
An extension to and a consolidation of all the other advanced accounting courses. Preparation for special accounting examinations.
- 621. Development of Accounting Thought (5). Pr., graduate standing or consent of instructor.**
The origin and development of accounting theories and concepts.
- 650. Seminar (1-10). Pr., graduate standing or consent of instructor.**
Intensive study and analysis of accounting and finance problems.
- 690. Special Problems (1-15).**
Variable content in the accounting and finance areas.
- 699. Research and Thesis. Credit to be arranged.**

Finance

- 320. Risk and Insurance (5). Pr., EC 200, junior standing.**
Essentials of risk management, with the emphasis on the use of insurance in meeting these risks; including the characteristics of property, liability, life and health insurance.
- 321. Property Insurance (5). Pr., ACF 320.**
The principles, uses and types of insurance with particular emphasis on fire, marine, automobile, and casualty lines.
- 322. Life Insurance (5). Pr., ACF 320.**
The organization of the life insurance business and the various types of contracts.
- 323. Real Estate (5). Pr., EC 200, junior standing.**
The fundamental principles and practices as applied to the purchase, sale, lease, mortgage, title, and management of real estate.
- 340. Personal Finance (3). Pr., non-business student, junior standing.**
Plans for managing personal financial problems involving insurance, housing, household budgeting, investments, personal and bank loans, credit and time buying, etc. Not open to Business students.
- 361. Principles of Business Finance (5). Pr., EC 202 and ACF 212.**
Short-term, intermediate and long-term financing of business firms.
- 363. Advanced Business Finance (5). Pr., ACF 361.**
A continuation of ACF 361 with emphasis on capital budgeting, cost of capital, growth, promotion, and reorganization.
- 367. Money Markets and Financial Institutions (5). Pr., ACF 212, EC 202 and junior standing.**
Structure and operation of commercial banks and other financial institutions and their role in the financing of business.
- 369. Management of Financial Institutions (5). Pr., ACF 361 and 367.**
Concentrated study of the internal operations of financial institutions, especially banks.
- 451. Multinational Financial Management (5). Pr., ACF 363 or consent of instructor.**
Intensive study of the impact of various tax regulations, currency controls and exchange rates on the multinational firm.
- 464. Investments (5). Pr., ACF 361, junior standing.**
Individual investment policies, investment institutions, and types of investments available.
- 466. Security Analysis and Portfolio Management (5). Pr., ACF 361, junior standing.**
Analysis techniques and selection of securities to meet specific investment objectives.
- 467. Consumer Finance (5). Pr., ACF 361 or consent of instructor.**
Analysis of the growth of consumer credit in the United States with emphasis upon recent legal and technological changes in the field of credit.
- 490. Special Problems. (1-10). Pr., ACF 312, senior standing.**
Advanced individual research and study in accounting and finance under guidance of a faculty member.

ADVANCED UNDERGRADUATE AND GRADUATE

- 561. Concepts of Managerial Finance (5). Pr., consent of the Director of Graduate Studies, School of Business.**
An accelerated course in finance and business applications.

GRADUATE

- 650. Seminar (1-10).** Pr., graduate standing or consent of instructor.
Intensive study and analysis of accounting and finance problems.
- 663. Advanced Corporation Finance (5).** Pr., ACF 361 or 561.
Intensive study of theory and problems of business finance from a decision making, internal, problem-solving point of view.
- 690. Special Problems (1-15).**
Variable content in the accounting and finance areas.

Aerospace Engineering (AE)

Professors Pitts, Head, Haneman, Harwell, Martin, and Sforzini
Associate Professors Cutchins, Nichols, Sherling, and Cochran
Assistant Professors Burkhalter and Foster

- 203. Aerospace Fundamentals (3).** Lec. 2, Lab. 3.
Aerospace concepts and terminology. General schemes and designs of aerospace systems and applications of computers to same. Duplicate credit will not be given for AE 203 and IE 204 or similar courses which include FORTRAN programming instruction.
- 300. Aerospace Analysis I (3).** Pr., MH 265.
Special methods and notations used in Aerospace Engineering.
- 302. Airloads (4).** Lec. 3, Lab. 3. Pr., ME 340.
Application of the basic equations of fluid dynamics to the prediction of pressure distribution, wing loading and hinge moments. Propeller design and selection.
- 303. Theoretical Aerodynamics I (4).** Pr., ME 340 and AE 300.
Fundamental analysis of aerodynamics, potential flow theory. Correlation of potential flow theory with experimental results.
- 304. Theoretical Aerodynamics II (4).** Lec. 3, Lab. 3. Pr., AE 303.
Fundamental principles of compressible flow including subsonic, transonic, supersonic, and hypersonic aerodynamics. High speed wind tunnels and laboratory techniques.
- 305. Flight Performance (3).** Pr., AE 302.
Equations of motion and solution techniques for vehicle performance analysis including effects of propulsion system and aerodynamic variations.
- 307. Aerospace Structures I (5).** Lec. 4, Lab. 3. Pr., ME 207.
Basic structural analysis. Shear and bending in monocoque structures. Deflections of beams and frames. Column and plate buckling. The laboratory portion is devoted to experimental techniques in stress analysis.
- 310. Aerospace Analysis II (4).** Pr., MH 265, ME 321.
Linear and non-linear systems, linearization procedures, and linear systems analysis techniques. Transfer functions and stability criteria for some aerospace systems and components. Other special techniques as required by advanced courses.
- 311. Aerospace Materials and Methods of Construction (2).** Pr., AE 307.
Nomenclature, coding systems, physical and structural properties, applications and fabrication techniques as applied to aerospace materials.
- 326. Fundamentals of Aerospace Dynamics (3).** Pr., AE 310.
Dynamics of aerospace vehicles in moving reference frames; Eulerian formulation for the vehicle as a rigid body; Lagrangian formulation and small oscillation theory. Provides a unified basis for further studies in aircraft vibration, flight dynamics, and space flight mechanics.
- 327. Microclimatology (3).** Lec. 3. Pr., MH 161, PS 204 or PS 205 or 220.
Heat balance at the soil-atmosphere interface; physical and thermal basis for observed distributions of temperature and moisture in the upper soil layers, and of temperature, moisture and wind in the atmospheric boundary layer; micro-climates related to topography, plants, animals and man.
- 330. Aerospace Instrumentation (3).** Lec. 2, Lab. 3. Pr., EE 261.
Basic theory and principles of operation of instrumentation used in Aerospace applications. System approach in taking measurements for Aerospace systems.
- 401. Aeronautical Problems I (1).** Lab. 3. Pr., senior standing.
Investigation of current aeronautical problems; preparation and presentation of technical papers and reports.
- 402. Aeronautical Problems II (1).** Lab. 3. Pr., AE 401.
Continuation of AE 401.
- 409. Aerospace Structures II (5).** Lec. 4, Lab. 3. Pr., AE 203 or IE 204 or equivalent knowledge of FORTRAN programming, AE 307, 310.
A continuation of AE 307. An introduction to the finite element method. The laboratory portion is devoted to the solution of structural problems on the digital computer.

427. Engineering Meteorology (3). Lec. 3.

Atmospheric composition, temperature distributions, stability-instability relationships with application to physical weather phenomena. The physics of precipitation, adiabatic charts, winds, and elementary forecasting.

439. Static Stability and Control (4). Lec. 3, Lab. 3. Pr., AE 304.

Introduction to static stability and control of flight vehicles including laboratory techniques for determination of stability parameters.

448. Aerospace Design I (1). Lab. 3. Pr., senior standing

An application of the design process oriented toward the aerospace field with emphasis on the development of creative thinking and team effort. A two quarter sequence with AE 449.

449. Aerospace Design II (1). Lab. 3. Pr., AE 448.

A continuation of AE 448.

450. Dynamic Meteorology I (3). Lec. 3. Pr., MH 265, AE 427 or consent of instructor, junior standing.

Methods of fluid dynamics applied to the atmosphere; equations of motion, continuity, energy and vorticity for a rotating earth. Horizontal motion of the atmosphere under balanced forces.

451. Dynamic Meteorology II (3). Lec. 3. Pr., AE 450, junior standing.

Continuation of Dynamic Meteorology I. Viscous effects in a turbulent atmosphere. perturbation equations. Diffusion of pollutants in the atmosphere. Energy and stability equations. Numerical weather prediction.

491. Special Problems (1-5 credit hours to be arranged). Pr., departmental approval. Not open to graduate students.**ADVANCED UNDERGRADUATE AND GRADUATE****500. Viscous Aerodynamics (4). Lec. 3, Lab. 3. Pr., AE 304.**

Theoretical background essential to a fundamental understanding of laminar and turbulent boundary layers and their relations to skin friction and heat transfer. Experimental techniques.

514. Equilibrium Gas Dynamics (3). Pr., consent of instructor.

Basic concepts of The Equilibrium Kinetic Theory and the equilibrium real gas properties. Aero-thermodynamic fundamentals of external flows for various atmospheric flight conditions in terms of flight speeds, altitudes and vehicle geometry.

515. Jet Propulsion (5). Pr., coreq., AE 304

Internal aerodynamics and thermodynamics of rockets and air-breathing jet engines. Jet nozzles. Detailed analysis of flow through turbojet compressors, combustors and turbines.

516. Rocket Propulsion I (3). Pr., AE 515.

Detailed analysis of the thermodynamics, gasdynamics, and design of liquid-propellant rockets.

517. Rocket Propulsion II (3). Pr., AE 515.

Design and performance analysis of solid-propellant rocket motors with emphasis on internal ballistics.

520. Dynamic Simulation (3). Pr., AE 326.

Computer techniques applied to the analysis of aerospace engineering problems using analog and hybrid computers and the digital problem-oriented language. Continuous System Modeling Program (CSMP).

521. Flight Vehicle Stress Analysis (3). Pr., AE 409.

Stress analysis of pressure chambers and vessels encountered in aerospace applications.

524. Nonequilibrium Gas Dynamics (3). Pr., consent of instructor.

Nonequilibrium Kinetic Theory of real atmospheric gases. Applications of the thermal and chemical nonequilibrium conditions to the external flows for various flight conditions.

528. Space Propulsion Systems (5). Pr., AE 515.

Introduction to reaction engines for use in outer space vehicles. Power requirements for space missions, nuclear power systems, ion engines, magnetohydrodynamics and plasma accelerators, and photonic engines.

529. Aircraft Vibration and Flutter (4). Pr., AE 326, AE 409.

Free, forced, and damped vibration of single and multiple degree-of-freedom systems; introduction to vibration of continuous systems; introduction to flutter theory; applications in aerospace.

532. Astrodynamics I (3). Pr., AE 326 or consent of instructor.

Geometry of the solar system, detailed analysis of two-body dynamics and introduction to artificial satellite orbits. Hohmann transfer and patched conics for lunar and interplanetary trajectories. Elements of orbit determination.

533. Astrodynamics II (3). Pr., AE 532.

Elements of special and general perturbation theory; n-body formulation and introduction to 3-body problem; introduction to powered flight analysis and space flight guidance.

534. Aerospace Systems Analysis (3). Pr., AE 310.

Modeling of system elements, analysis of systems undergoing various motions connected with flight, and introduction to optimal linear control systems.

535. Elements of V/STOL Flight (3). Pr., AE 303 or consent of instructor.

The analysis of methods for generating high lift at low vehicle forward speeds.

536. Rotary Wing Aerodynamics (3). Pr., AE 305.

Aerodynamics and flight characteristics of the rotary wing aircraft.

541. Dynamic Stability and Control (3). Pr., AE 326, 534, 439.

Derivation of the kinematic and dynamic equations used to describe the motions of aircraft. Analysis of the stability of steady state flight conditions. Response of aircraft to actuation of controls.

542. Automatic Stability and Control (3). Pr., AE 541.

Principles and techniques of automatic control of aircraft and missiles. Effects on design variables.

545. Missile Aerodynamics (3). Pr., AE 304, AE 439.

The aerodynamics of slender wing-body configurations for the low supersonic, moderate hypersonic and Newtonian continuum flow regimes. Linear and non-linear effects are considered as well as interference effects. Application to missile performance and stability for certain flight profiles.

GRADUATE**601. Advanced Supersonic Aerodynamics (5). Pr., AE 500.**

A rigorous development of linearized and nonlinear fluid flow theories and application. Lifting surfaces, lifting bodies, duct flow, boundary layer effects, shock and expansion waves, and method of characteristics are considered.

602. Advanced Elements of High Speed Aerodynamics (5). Pr., AE 601 or equivalent.

A continuation of AE 601 to include three-dimensional wing theory; slender body theory and similarity laws for subsonic, supersonic and hypersonic flow conditions.

603. High-Speed Viscous Aerodynamics (5). Pr., AE 602 or equivalent.

A continuation of AE 602 to include effects of conductivity and viscosity on aerodynamic properties.

604. Advanced Low Speed Aerodynamics (3-5 hrs. credit to be arranged) Pr., AE 300, 303.

Theoretical analysis of two dimensional airfoils. Joukowski transformations, Theodorsen's theory and other techniques for determining flow characteristics over any two-dimensional airfoil. Finite wing analysis, lift distribution on finite wings.

605. Aeroelasticity (3-5 hours credit to be arranged). Pr., AE 529. May be taken more than one quarter, not to exceed 10 hours.

General formulation of aeroelastic problems, buffeting, flutter and loss of control, dynamic stresses.

608. Aerospace Structural Dynamics (3-5 hours credit to be arranged). Pr., AE 529.

Advanced theory of matrix structural analysis with applications to dynamics of flight.

609. Advanced Aero-Structures (3). Pr., AE 529.

Vibrations of solids and wave propagation, introduction to general methodology and thermodynamics of solids, derivation of large-deflection equations, principles of basic solids investigations, and application to aerospace structures.

610. Advanced Vibrations Phenomena (3-5 hours credit to be arranged). Pr., AE 529.

Aerospace applications of dynamic phenomena measurement including linear varying differential transformers, piezoelectric accelerometers, dynamic force gages, and strain gages. On line use of hybrid and digital computers for data analysis and combined experimental simulation involving both experiment and computer. Use of various types of shakers in dynamic tests.

611. Thrust Generation (5). Pr., AE 515.

Aerothermodynamics of compressible flow, chemical propellant characteristics, heat transfer in fluid flow, nuclear propulsion.

612. Aerothermochemistry of Propulsion (3-5 credit hours to be arranged). Pr., AE 611 or consent of instructor.

Selected topics emphasizing interrelation between internal aerodynamics and combustion phenomena in air-breathing jet engines and rockets. Various techniques of establishing equilibrium composition and flame temperatures; comparison of frozen and equilibrium flow in nozzles; effects of condensed phases; supersonic combustion.

613. Advanced Air-Breathing Propulsion (3-5 credit hours to be arranged). Pr., AE 611 or consent of instructor.

Selected topics emphasizing interaction between external aerodynamics and performance of air-breathing jet engines, boundary layer effects in diffusers and compressors, and detailed analysis of various techniques of minimizing detrimental effects, compressor and turbine matching in turbojets, cascade aerodynamics, and variable area jet nozzles.

615. Hypersonic Flow Theory (3-5 hours credit to be arranged). Pr., AE 500, coreq., MH 461. May be taken more than one quarter, not to exceed 15 hours.

Hypersonic continuum theory, governing equations of motion for two and three dimensional flows, hypersonic small disturbance theory, viscous effects. Real gas effects in gas dynamics and rarefied gas flows, basic heat transfer concepts.

616. Real Gas Dynamics (3-5 hours credit to be arranged). Pr., consent of instructor. May be taken more than one quarter, not to exceed 15 hours.

A microscopic approach to the study of gas dynamics based on quantum mechanical models and statistical techniques.

- 617. Molecular Theory of Aerodynamics (3-5 hours credit to be arranged). Pr., consent of instructor. May be taken more than one quarter, not to exceed 15 hours.**
Free molecular, near-free-molecular, and transition flows of neutral gases are considered. Basic equations are developed and selected geometries are treated in detail.
- 619. Dynamics of Flight (5). Pr., AE 541 or consent of instructor.**
Small-disturbance theory and the linearized solutions of the general equations of unsteady motions, aerodynamic derivative, derivatives analysis, aerodynamic transfer functions, dynamic stability of uncontrolled longitudinal and lateral motions, solutions of the dynamic stability problems by electronic computing devices, inverse problem, automatic stability and control.
- 620. Flight Dynamics of Hypervelocity Vehicles (3-5 hours credit to be arranged). Pr., consent of instructor. May be taken more than one quarter, not to exceed 15 hours.**
Flight dynamics of steady and unsteady flight at hypersonic speeds, great-circle and minor-circle flight, re-entry, stability derivatives in hypersonic flow. Linearization of equations is investigated, static stability problems of hypervelocity vehicles are discussed.
- 632. Advanced Astrodynamics (3-5 credit hours to be arranged). Pr., AE 533 or consent of instructor. May be taken more than one quarter, not to exceed 15 hours.**
Selected topics from indirect and direct methods of trajectory optimization, trajectory isolation techniques, special and general perturbation theories, oblate earth problem, three body problem, space craft rotational motion, mission analysis methods, and new research developments.
- 635. Ion and Plasma Propulsion (5). Pr., consent of instructor.**
Basic physical and gas dynamic processes underlying methods for electrical acceleration of ionized gas flows appropriate to electrothermal propulsion, electrostatic propulsion, electromagnetic propulsion.
- 639. Particle Kinetics of Plasmas (3-5 hours credit to be arranged). Pr., consent of instructor. May be taken more than one quarter, not to exceed 15 hours.**
Gaseous plasmas based on the theory of individual particle kinetics. Emphasis will be placed on the development of basic concepts with sufficient generality to allow treatment of non-equilibrium problems of interest in aerospace research.
- 640. Magneto-Gas Dynamics (5). Pr., consent of instructor.**
Review of electrodynamics, Maxwell stresses, field and momentum-energy tensors. Thermo-dynamics of fluids in electromagnetic fields. Equations of motion of a conducting gas. Discussion of typical flow problems. Consideration of microscopic aspects of plasma flows.
- 645. Shock Tube Theory and Techniques (5). Pr., consent of instructor.**
Shock wave theory in real and perfect gases, expansion wave theory, reflected shock wave theory. Basic shock tube equations; effects of area change, driver types and characteristics. Non-ideal behavior in shock tubes, diaphragm opening effects, boundary layer effects, shock wave attenuation. Testing time derivation. Shock tube techniques and measurements.
- 646. Plasma Diagnostics (3-5 hours credit to be arranged). Pr., consent of instructor. May be taken more than one quarter, not to exceed 15 hours.**
Theoretical and applied studies of techniques for the measurement of plasma properties. The application of these techniques to aerospace research and testing.
- 690. Seminar. Credit to be arranged. May be taken more than one quarter.**
Provides weekly lectures on current developments in aerospace sciences by staff members, graduate students, and visiting scientists and engineers.
- 691. Directed Reading in Aerospace Engineering. (Credit to be arranged, not exceeding 5 hours.) May be taken more than one quarter.**
- 699. Research and Thesis. (Credit to be arranged.) May be taken more than one quarter.**
- 799. Research and Dissertation. (Credit to be arranged.) May be taken more than one quarter.**

Aerospace Studies (AF)

- 101. The Air Force Today (1). Lec. 1, Lab. 1.**
The history, organization and mission of the United States Air Force. Introduction to strategic offensive/defensive forces, general purpose forces, and aerospace forces.
- 102. The Air Force Today (1). Lec. 1, Lab. 1.**
A continuation of strategic forces studies to include nuclear weapons, aerospace defense, detection, warning significance of missiles and missile defense.
- 103. The Air Force Today (1). Lec. 1, Lab. 1.**
A continuation of U.S. general purpose forces to include organization and mission. A continued examination of aerospace support forces.

- 201. The Development of Air Power (1). Lec 1, Lab. 1.**
Development of air power over the past sixty years.
- 202. The Development of Air Power (1). Lec. 1, Lab. 1.**
Development of air power; continued focusing on factors which have prompted technological change.
- 203. The Development of Air Power (1). Lec. 1, Lab. 1.**
Development of air power; continued emphasizing of the various concepts of employment.
- 301. National Security Forces in Contemporary American Society (3) Lec. 3, Lab. 1.**
Communicative techniques utilized by the Air Force Officer, examination of the military profession, and civil-military interaction.
- 302. National Security Forces in Contemporary American Society (3), Lec. 3, Lab. 1.**
The Framework of defense policy, formulation of defense strategy, and the management of conflict.
- 303. National Security Forces in Contemporary American Society (3), Lec. 3, Lab. 1.**
The formulation and implementation of U.S. Defense Policy, organizational actors, and case studies in defense policy making.
- 401. Military Management (3). Lec. 3, Lab. 1.**
Fundamentals of the management process, including planning, coordinating and controlling.
- 402. Military Leadership (3). Lec. 3, Lab. 1.**
The need for leadership, the variables affecting leadership and examination of professionalism.
- 403. Military Justice (3). Lec. 3, Lab. 1.**
An examination of the Uniform Code of Military Justice and its effects on discipline.

Agricultural Economics and Rural Sociology (AEC) (RSY)

Professors Yeager, Head, Bell, Blackstone, Danner, White, and Wilson
Associate Professors Clonts, Dunkelberger, McCoy, and Stallings
Assistant Professors Adrian, Hardy, and Vanlandingham
Joint Appointee: Prof. Griessman, Head Dept. of Sociology

Agricultural Economics (AEC)

- 202. Agricultural Economics I (5). All quarters.**
Economic principles with emphasis on farm-related production, marketing, prices, consumption, taxation, credit, finance, public policies and tenure. Treats utilization of land, labor, and capital.
- 206. Agricultural Economics II (5). Pr., AEC 202 or equivalent.**
A continuation of economic principles with emphasis toward micro-economic concepts relating to farm firm.
- 301. Agricultural Marketing (5). Pr., AEC 202 or equivalent.**
Principles and problems in marketing farm products. Analysis of marketing functions, services, and costs; reducing costs and improving marketing efficiency. Marketing methods and distribution channels of major farm commodities. Market institutions and operation.
- 302. Farm Records and Tax Management (5). Pr., AEC 202 or equivalent.**
Types and uses of farm records and accounts with emphasis on analyzing records to improve net farm income. Interpretation of income tax regulations and preparation of farm tax returns with emphasis on tax management.
- 303. Agricultural Cooperatives (3). Pr., AEC 202.**
Principles and problems of organizing and operating farmers' cooperative buying and selling associations.
- 304. Agricultural Finance (3). Pr., AEC 202.**
Economic problems and policies in financing agriculture.
- 305. Farm Appraisal (3). Pr., AEC 202.**
The theory of land values; techniques on farm land and building appraisals for different purposes; relationships of land use, soils, crops, forestry management, buildings, land titles, farm prices, taxes, and interest rates to land values; evaluation of appraisal methods and forms currently in use.
- 307. Agricultural Law (5).**
Legal environment of agriculture. Recognition of legal problems associated with property ownership, contracts, torts, financing, estate planning and environmental controls and restrictions.
- 490. Senior Seminar (1). Lec. 1. Pr., senior standing.**
Current developments in Agricultural Economics; the role of Agricultural Economics in the general economy.

- 499. Directed Studies in Agricultural Economics (1-5). Pr., consent of instructor, junior standing.**

Individualized work and study in consultation with faculty member on subject of mutual concern. May include directed readings, research, analysis of an employment experience or a combination. Employment experience with a variety of agribusiness and agencies may serve as the focus.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. Farm Management (5). Pr., AEC 202 or equivalent.**

Principles of economics applied to agriculture, uses of farm records and analysis of records to improve management of the farm; developing enterprise budgets and use of them in preparing a profit-maximizing farm plan.

- 503. Agricultural Prices (3). Pr., AEC 202 or equivalent.**

Principles and factors in the pricing process with special reference to agricultural products and markets. Functions of prices and principles of supply and demand in price determination.

- 505. Agricultural Policy (3). Pr., AEC 202 or equivalent.**

Concepts, objectives and operation of public policies affecting agriculture. Development of agricultural policies in the United States.

- 509. Resource Economics (5). Pr., AEC 202 or equivalent.**

Principal economic and institutional factors affecting man and his use of land. Supply, demand, and future requirements for land. Property rights, land use planning, zoning, taxation and other social controls affecting land utilization.

- 510. Agricultural Business Management (3). Pr., AEC 202 or equivalent.**

Principles and problems involved in acquiring, organizing and operating successful agricultural businesses, capital requirements for selected agricultural businesses, factors affecting location and growth, and measures of technical and economic efficiency in organization and operation; practices involved in buying, pricing, and merchandising, management problems and policies in financing, personnel, and public relations.

- 512. Economic Aspects of Water Resources Management (5).**

The supply, demand, and use of water resources including economic, legal, and political dimensions. Economics of management of water resource use and conservation in terms of present and future supplies and needs. Both public and private water resources will be considered.

- 560. Introduction to Econometrics (5). Pr., MH 161 or equivalent, EC 274 or equivalent, and AEC 202 or equivalent.**

Formulation of elementary economic models using economic theory and mathematics with certain basic assumptions or axioms. Mathematical tools used in economic analysis.

GRADUATE

- 601. Advanced Farm Management (5).**

Advanced theory and application of farm management principles and other economic concepts in agriculture. Organization, operation, and management of various types of farms. Optimum utilization of available resources on individual farms.

- 602. Advanced Agricultural Prices (5). Pr., EC 274.**

Methods of price analysis, separation of fluctuations from price trends, measurement of changes in supply and demand of farm products. Prices, price trends, price cycles, and other price structures.

- 603. Advanced Land Economics (5).**

Man and his use of land as related to institutional factors. Economics of natural resource use, economic feasibility, benefit-cost analysis, economics of environmental control, and factors related to rural and urban land use.

- 605. Advanced Agricultural Marketing (5).**

Theory of marketing with emphasis on its application to methods used and problems faced in marketing farm products. Objectives in agricultural marketing.

- 606. Agricultural Market Organization (5). Pr., EC 551.**

The theoretical approach to marketing problems characterized by imperfectly competitive structures and multiple markets separated by time, space, and farm attributes. Theory of interregional trade and location of economic activity. Efficiency of firms and product movement.

- 608. Economics of Agricultural Production (5). Pr., EC 551.**

Resource allocation and efficiency of production. Production and efficiency in the firm, between firms, and between agriculture and other industries. Influences on agricultural resource allocation and efficiency of risk and uncertainty including price instability, institutional changes, technological advances, imperfect knowledge of production methods, and variations in the human element with emphasis on the role of management.

- 609. Dynamics of Agricultural Production and Management (5). Pr., AEC 608.**

Dynamics of resource allocation and efficiency of production as influenced by price, institutional, and technological changes. Imperfect knowledge and the human element in management.

610. Quantitative Research Techniques in Agricultural Economics (5).

An introduction to basic quantitative techniques with emphasis on linear programming and its extensions. Concepts of input-output analysis, Markov chain analysis, dynamic programming, inventory control, queuing processes, replacement and game theory are also introduced. General theoretical background and associated computational procedures are used for presentation of each technique.

611. Economic Development (5).

Conceptual and empirical analysis of economic development with emphasis on the lesser developed areas and countries. Analysis of financial and technical aid to other countries and case studies of development problems will be incorporated.

616. Resource Economics, Policies and Programs (5).

Impact of resource development on regional economic growth. Effect of taxation and tax policies. Interaction between technological change, resource use, and economic growth. Analysis of current policies and programs.

620. Directed Readings in Regional Planning (5).

Assigned readings and pursuant discussions on delineation of economic areas, resource use and allocation, economic regions, watershed development, planning legislation, zoning, housing, land use restrictions, conservation, and recreation.

621. Regional Planning Analysis (5).

Theories of regions and problems of multi-jurisdictional planning. Analysis of metro-area and regional planning by states. Comprehensive planning by agencies such as TVA, Corps of Engineers, BOR, and Appalachian Commission. Regional planning and intergovernmental relations.

625. Economics of Aquaculture (5). Pr., AEC 202 or consent of instructor.

Theory and application of economic principles of production, marketing, and consumption applied to aquaculture with emphasis on fish produced in ponds. Marginal and locational analyses, fish production as a farm enterprise and commercial significance.

670. Research Methods in Agricultural Economics (3).**680. Special Problems in Agricultural Economics. Credit to be arranged.****690. Seminar (1-1-1). Fall, Winter, Spring.****699. Research and Thesis. Credit to be arranged.****Rural Sociology (RSY)****261. Rural Sociology (5).**

The basic sociological concepts and principles as applied to life in the rural community. Special attention given to the culture, social organization, and social problems of rural people in the United States, and in the South in particular. Credit not allowed in this course and SY 201.

362. Community Organization (5). General elective.

Understanding the principles of community organization and effective citizenship. Survey of institutions, organizations, and agencies interacting to meet community needs.

370. Methods of Social Research (5). Pr., RSY 261 or SY 201.

The principal methods of data collection and analysis in sociological research.

499. Directed Studies in Rural Sociology (1-5). Pr., consent of instructor, junior standing.

Individualized work and study in consultation with faculty member on subject of mutual concern. May include directed readings, research, analysis of an employment experience or a combination. May be used to complement and expand on an employment experience.

ADVANCED UNDERGRADUATE AND GRADUATE**561. Rural Social Organization (5). Pr., RSY 261 or SY 201.**

Nature of rural social organizations with emphasis on their structure, function and change. Extent to which organizations meet needs of rural people and principles of improving effectiveness.

562. Sociology of Community Development (5). Pr., RSY 261 or SY 201.

Various approaches to development of human resources and planning of changes within the total community. Development in different types of communities in the U.S. and world is considered with emphasis on small population centers.

GRADUATE**641. Extension Programs and Methods (5).**

An in-depth consideration of extension orientation in adult and continuing education in U.S. and developing nations. The Cooperative Extension Service is analyzed as an educational institution. Fundamental steps in program development and evaluation.

661. Sociology of Regions (3).

Social and demographic phenomena having implication for regional planning and development with emphasis on Southern region and subregions. Intra and inter-regional influences, socio-cultural structure, value orientations, population, changes and trends, and metropolitanization.

662. Social Systems and Communities (3).

Interrelationship of institutions and organizations within the community and to large societal systems—regional and national. Emphasis on small towns and metropolitan centers relative to planning community change.

670. Research Methods in Sociology (3).**680. Special Problems in Rural Sociology. Credit to be arranged.****699. Research and Thesis. Credit to be arranged.****Agricultural Engineering (AN)**

Professors Kummer, *Head*, Renoll

Associate Professors Busch, Hamilton, and Koon

Assistant Professors Flood, Rochester, and Young

Adjunct Professor Gill

Adjunct Associate Professors Hendrick, Reaves, Schafer, and Taylor

301. Mechanics of Farm Machines (3). Lec. 2, Lab. 3. Pr., ME 321, MH 265, IE 204.

Basic concepts and engineering principles of farm machinery, including basic design, power needs and their measurement, functional and economic analysis, utilization and management, testing, and safety as related to farm machines.

302. Mechanics of Tractor Power (3). Lec. 2, Lab. 3. Pr., MH 265, ME 321, ME 301, IE 204.

Basic concepts and engineering principles of the farm tractor, including mechanics of the tractor, stability, traction, weight transfer, thermal efficiency, energy sources, economics, safety, testing and power measurement as related to tractors and power units.

303. Soil and Water Engineering I (4). Lec. 3, Lab. 3. Pr., ME 340, IE 204.

Surveying procedures and application to soil and water problems. Rainfall-runoff relationships. Soil erosion mechanics and control methods. Upstream flood control analysis and design.

304. Drainage and Irrigation Engineering (3). Lec. 2, Lab. 3. Pr., AN 303.

Soil-water-plant relationships. Theory and design of drainage systems. Irrigation systems design. Water quality and supply. Legal and economic aspects.

305. Agricultural Processing Engineering (3). Lec. 3. Pr., ME 301, ME 340.

Introduction to process engineering, fundamental concepts, theory of unit operations such as pumps, fans, size reduction, cleaning, bulk movement, and heat transfer and mass transfer.

306. Electrical Systems in Agriculture (3). Lec. 3. Pr., EE 261, Coreq., EE 263.

Application of electrical power, equipment and control devices to agricultural systems. Special emphasis on safe and efficient power distribution, motor selection and performance, and theory and performance of sensing and control devices.

307. Agricultural Structures Design I (3). Lec. 2, Lab. 3. Pr., ME 207.

Analysis and design of structural systems of agriculture.

350. Soil and Water Technology (5). Lec. 4, Lab. 3. Fall, Spring, Summer.

Technical application of soil and water resources management. Irrigation system planning and equipment selection.

351. Agricultural Machinery Technology (5). Lec. 4, Lab. 3. Fall, Spring, Summer.

Agricultural machinery: utilization, management, selection, and economic justification.

352. Tractor and Engine Technology (5). Lec. 4, Lab. 3. Winter.

Tractors and engines. Operation, fuels used, size selection, utilization, and economic justification.

353. Farm Building Technology (5). Lec. 4, Lab. 3. Winter.

Selection of materials, methods of construction and functional needs of modern farm buildings.

354. Agricultural Processing Technology (5). Lec. 4, Lab. 3.

Agricultural processing systems: includes storing, drying, pelleting, mixing and automatic materials handling systems.

410-411. Special Problems (3-3). Pr., faculty adviser approval and AN 301-307.

Individual student endeavor supervised by instructor involving special Agricultural Engineering topics to which the engineering electives selected by the student will be complementary.

ADVANCED UNDERGRADUATE AND GRADUATE**501. Agricultural Power and Machinery Design (3). Lec. 2, Lab. 3. Pr., AN 301, AN 302.**

Design of equipment and systems to apply engineering principles to solutions of agricultural power and machinery problems. Functional requirements, safety, reliability, service conditions, power measurement, useful life, and creative design are combined to obtain designs for agricultural machine and power units.

503. Soil and Water Engineering II (3). Lec. 2, Lab. 3. Pr., AN 304.

Small watershed hydrology. Open channel hydraulics applied to the design of irrigation, drainage, and erosion control facilities. Hydraulic design of conduits, and stilling basins.

- 505. Electrical and Processing Systems Design (3). Lec 3. Pr., AN 305, AN 306.**
Design and layout of material handling systems, fundamental theory of particle movement, study of sensing and feed-back systems to include automatic controls and servo-mechanisms.
- 507. Agricultural Structures Design II (3). Lec. 3. Pr., AN 307.**
Functional requirements and design of animal shelters and agricultural storage buildings.
- 522. Farm Power and Equipment (5). Half-quarter course. Pr., AN 351. For Vocational Agriculture Teachers. Summer.**
- 524. Farm Electrification (5). Half-quarter course. For Vocational Agriculture Teachers. Summer.**
- 526. Farm Irrigation(5). Half-quarter course. For Vocational Agriculture Teachers. Summer.**
- 532. Engineering in Agriculture I—Agricultural Machinery (3). Lec.-Dem. 4. Pr., graduate standing.**
The utilization of modern agricultural machinery on the farm with emphasis on safety, management, costs, economic justification, and principles of operation. (Credit for both AN 532 and AN 522 may not be used to meet requirements for the Master's degree.)
- 534. Engineering in Agriculture II—Agricultural Power (3). Lec.-Dem. 4. Pr., graduate standing.**
Farm tractor and power units used on the farm; includes the basic principles of operation with major interest toward lubrication, costs, operational problems, safety and a comparison of gasoline, Diesel, and LP gas fuels, and units. (Credit for both AN 534 and AN 522 may not be used to meet requirements for the Master's degree.)

GRADUATE

- 601. Advanced Small Watershed Hydrology (4). Pr., AN 503, CE 512.**
Hydrograph synthesis. Mathematical modeling of runoff and streamflow. Probability analysis of hydraulic events. Design of upstream systems for flood and erosion control and water supply.
- 602. Advanced Farm Power and Machinery (5). Pr., AN 501.**
Principles of operation and analysis of design of basic machine elements, hydraulic systems and functional requirements of farm power units, agricultural machinery and materials of construction.
- 604. Agricultural Engineering Problems. Credit to be arranged not to exceed a total of 5 hours.**
Special advanced engineering and design problems.
- 605. Soil Dynamics of Tillage and Traction (3). Pr., AY 555 and consent of instructor.**
Analysis and measurements of soil reactions, as affected by the physical properties of the soil, when subjected to forces imposed by tillage implements and traction devices. Considered are shear, cohesion, adhesion, consolidation, plasticity and abrasion soil properties.
- 607. Engineering Principles of Animal Environment (3). Lec. 3. Pr., AN 507 or consent of instructor.**
Design and analysis of environmental equipment and systems for control or modification of animal production. Emphasis on evaluation of environmental factors which influence total environment.
- 608. Seminar. Credit to be arranged. All quarters.**
Reviews and discussions of research techniques, current scientific literature and recent developments in agricultural engineering research.
- 610. Biological and Physical System Analysis 1 (3). Pr. MH 362.**
Mathematical analysis of biological and physical systems including the formulation of differential equations with analytical and numerical solution techniques. Solutions by regression equations and by physical models. Decisions made under certainty, risk and uncertainty.
- 611. Biological and Physical System Analysis II (3). Pr., AN 610. A continuation of AN 610.**
- 699. Research and Thesis. Credit to be arranged.**
May be taken more than one quarter.
- 799. Doctoral Research and Dissertation. Credit to be arranged.**

Agronomy and Soils (AY)

Professors Ensminger, *Head*, Adams, Cope, Donnelly,
Hiltbold, Hood, Hoveland, Johnson, King, Rogers,
Scarsbrook, and Wear

Associate Professors Buchanan, Dickens, C. Evans, E. Evans, Hajek and King
Assistant Professors Bennett, and Haaland

- 201. Principles of Grain Production (5). Lec. 4, Lab. 2. Winter, Spring.**
Fundamental factors involved in the economic production of corn, small grains, grain sorghum, peanuts and soybeans.

- 304. General Soils (5). Lec. 4, Lab. 2. Pr., CH 105 and 105L or CH 207. Winter, Spring.**
The formation, classification, composition, properties, management, fertility, and conservation of soils in relation to the growth of plants.
- 305. General Soils (5). Lec. 4, Lab. 2. Pr., CH 103-104. Winter.**
The formation, classification, composition and properties of soils and their influence on vegetative growth and development on forest lands. Open only to students in Forestry.
- 307. General Soils (5). Lec. 4, Lab. 2. Pr., CH 103-104. Fall, Spring.**
The general field of soils including genesis, classification and fertility.
- 310. Earth Science (5).**
Materials of the earth; forces that shape and sculpture the earth's surface, including weathering, water, soil formation and erosion; soil geography; and historical geology. (Not open to students in School of Agriculture. Credit toward degree may not be earned in both this course and a General Soils course.)
- 311. The Philosophy of Agricultural Sciences (3). Winter.**
Principles of agricultural science illustrated by current and historical examples.
- 315. Turfgrass Management (5). Lec. 3, Lab. 4. Pr., BY 102. Fall.**
The management of recreational and home area turfgrass will be studied and will include the establishment and maintenance of turf and the effect of light, traffic, soil fertility, and water on its growth.
- 401. Principles of Forage Production (5). Lec. 4, Lab. 2. Pr., junior standing. Fall, Spring.**
Grass and legume forage crops. The crops are considered from the standpoint of (a) pasture crops, (b) hay and silage crops, (c) soil improving crops.
- 404. Fiber and Oil Crops (5). Lec. 5. Pr., junior standing. Winter.**
Most of the time will be devoted to cotton, soybeans and peanuts with a limited amount of time devoted to other fiber and oil crops.
- 499. Special Problems (1-5). Credit to be arranged. Pr., departmental approval, junior standing. Not open to graduate students.**
Students will work under the direction of a staff member on special problems in crop or soil science.

ADVANCED UNDERGRADUATE AND GRADUATE

- 502. Soil Fertility (5). Lec. 5. Pr., AY 304, 305 or 307. Spring.**
Lectures, demonstrations and problems illustrate principles of soil fertility as related to fertilizer practices and crop production. An advanced course, required of all students majoring in Agronomy and Soils. Either AY 502 or AY 507, but not both, may be used to satisfy the minimum requirement for the Master's degree.
- 506. Fertilizers and Soil Testing (5). Lec. 4, Lab. 2. Pr., AY 304, 305 or 307. Winter.**
Manufacture and properties of fertilizer materials; properties and formulation of fertilizer mixtures; relative efficiency of various plant nutrient sources; principles and methods of soil testing and plant tissue testing.
- 507. Soil Management (5). Lec. 5. Pr., AY 304, AY 305, or AY 307. Summer.**
Physical, chemical and biological properties of soils and their management. An advanced course designed for students in Agricultural Education. Either AY 502 or AY 507, but not both, may be used to satisfy the minimum requirement for the Master's degree.
- 508. Soil Resources and Conservation (5). Lec. 4, Lab. 2. Pr., AY 304, 305 or 307. Fall.**
Soils as a natural resource for land-use planning; their classification and management for crop production, recreation, and urban and industrial development.
- 509. Seed Production (3). Pr., AY 201, or 401. Spring, odd years.**
Methods and factors affecting production, storage, and processing seed.
- 510. Methods of Plant Breeding (5). Lec. 4, Lab. 2. Pr., ZY 300. Fall, even years.**
A general course in the principles and methods of plant breeding.
- 514. Principles and Use of Herbicides in Crop Production (5). Lec. 4, Lab. 2. Pr., CH 104. Fall.**
Principles and use of herbicides in agronomic crops. Acquaints the students with methods of application including equipment, time of application, methods of incorporation and formulation of herbicides. The fate of herbicides in soil and the ecological impact on succeeding plant species.
- 515. Soil Morphology (5). Lec. 3, Lab. 4. Pr., AY 304, 305 or 307. Spring.**
Physical, chemical and mineralogical properties of soils are studied in relation to their classification for engineering and agricultural uses.
- 516. Advanced Turfgrass Management (5). Pr., AY 304, AY 315, BY 306. Spring, even years.**
Factors affecting the grass plant as a component of a dynamic turf community. Influence of soil chemical and physical conditions, management practices and climate will be discussed. Both theoretical and practical aspects of turf cultural practices will be discussed along with design and construction of athletic turf areas.
- 517. Crop Quality (5) Lec. 5. Pr., AY 201, 401. Spring.**
Quality of food, feed and fiber crops as regulated by genetic potentials, environment, management and utilization.
- 555. Soil Physics (5). Pr., AY 304. Fall, odd years.**
Lecturers and demonstrations to illustrate fundamental physical properties of soils.

GRADUATE

- 601. Agronomy Problems (1-5). Credit to be arranged.**
Conferences, problems, and assigned reading in soils and crops, including results of agronomic research from the substations and experiment fields.
- 606. Soil Microbiology (5). Lec. 3, Lab. 4. Pr., AY 502 and BY 300. Spring, odd years.**
Soil microorganisms and their physiological processes related to soil development and plant nutrition. The role of microorganisms affecting the chemical and physical properties of soils will be studied, with emphasis on the cyclical transformations of nitrogen, phosphorous, carbon, and sulfur.
- 608. Experimental Methods (5). Fall, even years.**
Experimentation in the agricultural sciences including experimental techniques, interpretation of research data, use of library references and preparation of publications, and consists of problems, assigned readings, and lectures.
- 615. Seminar in Genetics (1). Pr., ZY 300.**
Reports by students and staff members on current research and the literature in the field of genetics.
- 616. Advanced Plant Breeding (5). Lec. 4, Lab. 2. Pr., ZY 300. Winter, even years.**
Principles, methods, and techniques involved in plant breeding. Laboratory work will consist of studying active plant breeding programs, studying pollination techniques, and making pollinations. A term paper will be required.
- 617. Experimental Evolution (5). Pr., ZY 300 and AY 616. Spring, even years.**
The factors affecting the evolution of species.
- 618. Crop Ecology (5). Pr. BY 306 or ADS 204. Winter, even years.**
World population and food production problems. Origin, distribution and adaptation of crop plants as influenced by environment with emphasis on climatic factors. Lectures and reading from current literature.
- 619. Theories in Forage Crops Management (5). Lec. 3, Lab. 4. Pr., AY 401 and BY 306 or ADS 204. Winter, odd years.**
Principles involved in successful establishment, maintenance, and management of crops used for grazing, hay and silage. Several field trips will be made to research stations and private farms to observe management practices.
- 625. Physiological Aspects of Crop Yield (5). Lec. 4, Lab. 2. Pr. BY 306, CH 208. Summer, even years.**
Principles of plant physiology as related to crop yield. Current crop physiological research discussed emphasizing methods of investigation and interpretation of results.
- 654. Advanced Soil Fertility (5). Pr., AY 502. Spring, even years.**
Composition, properties and management of soils in relation to the nutrition and growth of plants.
- 655. Soil and Plant Analysis (5). Lec. 2, Lab. 6. Pr., CH 206 and AY 502. Winter, odd years.**
Principles, methods, and techniques of quantitative chemical analysis of soils and plants applicable to soil science.
- 656. Soil Clay Mineralogy (5). Lec. 4, Lab. 2. Fall, even years.**
Crystal structure and properties of the important clay size minerals of soils and clay deposits combined with identification techniques involving X-ray diffraction and spectroscopy, differential thermal analysis, electron microscopy, specific surface analysis, and infrared absorption.
- 657. Soil Chemistry (5). Pr., CH 407 and AY 502. Fall, odd years.**
Interpretation of soil properties and chemical reactions in terms of ion exchange, solubility diagrams, solution equilibria, electrochemistry, and electrokinetics of charged particles.
- 658. Advanced Soil Physics (5). Lec. 2, Lab. 6. Pr., MH 263, PS 205-206, and AY 555.**
Physical properties of soils in relation to plant growth. Emphasis is placed on methods of measuring soil physical properties and the interpretation of these measurements in terms of plant growth.
- 699. Research and Thesis. Credit to be arranged.**
Research and thesis on problems related to crop production, plant breeding, soil fertility and soil chemistry.
- 799. Doctoral Research and Dissertation. Credit to be arranged.**

Animal and Dairy Sciences (ADS)

Professor Warren, *Head*, Anthony, Autrey, Cannon, Harris, Hawkins, Huffman, Parks, Patterson, Smith, Strength, and Wiggins
Associate Professors Daron, Edwards, McCaskey, Scarth, Rollins, and Tucker
Assistant Professors Jones, Marple, and Schmidt
Instructor Cordray

- 101. Man's Food (3). Lec. 3. Fall, Winter, Spring.**
Analysis of the world food supply; problems of food availability and distribution; methods of alleviating food shortages; role of the food processor.

- 200. Introductory Animal and Dairy Sciences (5). Lec. 4, Lab. 2. Fall, Winter, Spring.**
Provides some understanding of the scope and importance of the field. The importance of livestock to agriculture and to the nutrition of people. The role of nutrition, breeding, selection and management in livestock production.
- 201. Introductory Food Science and Technology (5). Fall.**
The nature of the principal food industries: applications of chemistry and microbiology in food processing technology.
- 204. Animal Biochemistry and Nutrition (5). Pr., CH 104. Fall, Winter, Spring.**
Principles of animal biochemistry and nutrition and a study of nutrients and their utilization by animals.
- 209. Horse Production (3). Lec. 2, Lab. 2. Spring.**
The selection, breeding, feeding, management and use of horses in the Southeast.
- 210. Introductory Meat Science and Technology (4). Lec. 2, Lab. 4. Fall, Winter.**
Theory and practice of slaughtering and cutting, identification and uses of meats.
- 301. Livestock Judging (3). Lec. 1, Lab. 4. Pr., ADS 200, junior standing. Winter, Spring.**
Theory and practice in the selection of beef cattle, swine, sheep and horses
- 302. Feeds and Feeding (3). Pr., ADS 204. Fall, Winter, Spring.**
Principles and practices of balancing and compounding of rations for beef and dairy cattle, sheep, and swine.
- 309. Live Animal and Carcass Evaluation (3). Lec. 1, Lab. 4. Pr., ADS 200, ADS 210. Winter, Spring.**
Classifying and grading market hogs, cattle and sheep with major emphasis on indicators of carcass merit. Carcass grading, yield grading and evaluation.
- 312. Dairy Food Processing (3). Lec. 2, Lab. 2. Fall.**
Product standards and identity. Basic operations in the processing of dairy foods. Methods of quality assurance.
- 314. Dairy Cattle Judging (3). Lec. 1, Lab. 4. Pr., ADS 200.**
Theory and practice in the selection of dairy cattle.
- 407. Advanced Livestock Judging (3). Lec. 1, Lab. 4. Pr., ADS 301, approval of instructor. Fall.**
An advanced course in the selection and grading of livestock.
- 420. Undergraduate Seminar (1). Pr., senior standing. Winter.**
Lectures, discussions and literature reviews by staff, students and guest lecturers.
- 422. Animal Disease Control (5). Pr., BY 300 and ZY 251 or equivalent. Spring.**
Etiology, prevention and control of the important diseases of farm animals.
- 490. Special Problems (1-5). Credit to be arranged. Pr., departmental approval, senior standing. Not open to graduate students.**
Students will work under the direction of staff members on specific problems.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. Swine Production (5). Lec. 4, Lab. 2. Pr., ADS 200, 204. Fall, Spring.**
Practical problems involved in the breeding, feeding, and management of swine for economic production.
- 502. Beef Cattle Production (5). Lec. 4, Lab. 2. Pr., ADS 200, 204. Fall, Winter.**
Practical phases of breeding, feeding, and management of beef cattle for economic production.
- 503. Animal Breeding (5). Lec. 4, Lab. 3. Pr., ZY 300. Fall, Spring.**
Application of genetic principles to the breeding of cattle, sheep, and swine. Studies of different systems of breeding and selection and their related efficiencies for livestock improvement.
- 504. Dairy Cattle Production (5). Lec. 4, Lab. 2. Pr., ADS 200, 204. Spring.**
Practical phases of breeding, feeding and management of dairy cattle for economic production.
- 505. Physiology of Lactation (5). Lec. 4, Lab. 2. Pr., departmental approval. Spring.**
Anatomy and physiology of milk secretion; milk precursors; factors affecting composition of milk.
- 506. Animal Reproduction (5). Lec. 4, Lab. 2. Pr., ZY 251 or equivalent. Winter.**
Anatomy and physiology of the male and female reproductive tract; hormones; estrus and estrual cycle; ovulation, mating, gestation, parturition; sperm physiology; collection, storage and dilution of semen; artificial insemination; fertility, sterility; pregnancy tests.
- 508. Advanced Animal Nutrition (5). Lec. 4, Lab. 2. Pr., ADS 204, ADS 302. Winter, Spring.**
Animal nutrition and application to the production of farm animals, including physiology of nutrition, metabolism of nutrients and recent nutritional developments.

- 510. Meat Technology (4). Lec. 2, Lab. 4. ADS 210. Spring.**
A study of meat curing and processing procedures and the biochemical alterations of meat during aging, curing and processing.
- 511. Dairy Chemistry (5). Lec. 3, Lab. 4. Pr., CH 208. Fall.**
Chemistry of milk constituents; interaction of constituents with one another under various conditions; analysis of milk, milk constituents, and milk products.
- 512. Frozen and Concentrated Dairy Foods (3). Lec. 2, Lab. 2. Pr., ADS 312. Winter.**
Specialized techniques in the processing and handling of frozen and concentrated dairy foods.
- 513. Fermented Dairy Foods (3). Lec. 2, Lab. 2. Pr., ADS 312. Spring.**
Bacterial culture handling, processing and curing of cheese varieties, processing and handling cultured milk products.
- 514. Food Microbiology (5). Lec. 3, Lab. 4. Pr., BY 300. Spring.**
The relationship of habitat to the occurrence of microorganisms on food; environment affecting the growth of various microorganisms in food; microbiological action in food spoilage and food manufacture; physical, chemical and biological destruction of microorganisms in foods; microbiological examination of foodstuffs; and public health and sanitation bacteriology.
- 515. Food Plant Sanitation (3). Lec. 2, Lab. 2. Winter.**
Sanitary regulations of food plants. Principles and procedures of cleaning and sanitizing food handling equipment.
- 516. Advanced Meat Science and Muscle Biology (4). Lec. 3, Lab. 3. Pr., ADS 210 or equivalent. Spring.**
Advanced studies of composition of meat; muscle microanatomy, biochemical and physiological aspects of muscle contraction; muscle physiology and meat quality.
- 518. Biochemistry (5). Lec. 4, Lab. 3. Pr., CH 208. Fall.**
Classification, structure and chemistry of the major chemical constituents of living matter. (Same course as CH 418.)
- 519. Biochemistry (5). Lec. 4, Lab. 3. Pr., ADS 418 or its equivalent. Winter.**
Introduction to metabolism. (Same course as CH 419.)

GRADUATE

(Graduate Standing Required)

- 600. Muscle Physiology and Biochemistry (5). Pr., ADS 516, ADS 518 or equivalent.**
Biology of muscle growth and metabolism and the post-mortem phenomena associated with the conversion of muscle to meat.
- 602. Technical Control of Dairy Products (5). Pr., ADS 312, 511, 514.**
Advanced methods of analyses of dairy products and the relation between composition and processing methods.
- 607. Comparative Animal Nutrition (3). Pr., ADS 508. Fall.**
Advanced comparative nutritional requirements in beef and dairy cattle, sheep, swine and laboratory animals.
- 608. Advanced Animal Reproduction (5). Pr., ADS 506, ZY 524.**
Advanced studies of physiology and endocrinology of reproduction.
- 611. Seminar. Credit to be arranged.**
- 612. Genetics of Populations (5). Pr., ADS 503.**
Genetic composition of populations and factors affecting rates of change and conditions of equilibrium.
- 614. Minerals (5). Pr., CH 208 and satisfactory courses in animal nutrition.**
The specific functions of minerals in animal metabolism.
- 615. Ruminant Nutrition (5). Pr., ZY 524 and ADS 519.**
Rumen fermentation and the biochemistry of ruminant metabolism.
- 617. Microbial Biochemistry (5). Pr., 5 hours of microbiology and ADS 519.**
The anatomy, growth and metabolism of the bacterial cell with emphasis on the biochemical makeup of the cell and the regulation of its activities.
- 619. Experimental Methods (5). Pr., satisfactory courses in biological statistics.**
Research methods in the animal sciences including design of experiments, experimental techniques, analysis and interpretation of data, evaluation of research literature and preparation of publications.
- 641. Proteins (5). Pr., ADS 519 or its equivalent. Spring.**
Chemical and physical properties of amino acids and proteins, protein structures, and the relation of protein structure to function.
- 642. Lipids (5). Pr., ADS 519 or its equivalent. Summer, even years.**
Chemistry of the lipids and their biological significance.
- 643. Enzymes (3 or 5). Pr., ADS 519 or its equivalent and departmental approval. Winter.**
The principles of enzyme chemistry including the physical, chemical and catalytic properties of enzymes; classification of enzymes; and enzyme formation.

- 644. Topics in Biochemistry (2-6 hrs. credit—to be arranged). Pr., ADS 519, or its equivalent and approval of instructor. Fall, Winter, Spring.**
Advanced study in selected areas of metabolism and the techniques of characterization of macromolecules.
- 645. Biochemical Research Techniques (5). Pr., ADS 519 or its equivalent. Summer.**
Modern biochemical laboratory techniques.
- 690. Special Problems (1-5 hours. Credit to be arranged.)**
Conference problems, assigned reading and reports in one or more of the following major fields: (a) animal biochemistry and nutrition, (b) animal breeding and genetics, (c) physiology of reproduction, (d) nutritional pathology, (e) animal production, (f) experimental pathology, (g) histochemistry, (h) meats, and (j) dairy products.
- 699. Research and Thesis. Credit to be arranged.**
Research and thesis may be on technical laboratory problems or on problems directly related to beef, cattle, dairy cattle, sheep or swine.
- 799. Doctoral Research and Dissertation. Credit to be arranged.**

Anthropology (ANT)

For listing of courses see page 333.

Architecture (AR)

Professors Davis, Doerstling, Kemp, Head, Millman, McPheeters, Pfeil, Schaer, Snow, and Speer

Associate Professors Bryant, Carter, Faust, Haire, Latta, and Uthman

Assistant Professors Baxley, Blackwell, Gwin, Hoffman, Johnston, Lanter, and Zwirn
Instructors Plaxco and Wilkerson

Architecture Program (AR)

- 110-111-112. Design Fundamentals (5-5-5) Lab. 10-10-10. Pr., acceptance into AR or ID Curriculum.**
Architectural drawing and basic rendering and communication techniques. Elemental design concepts employing two and three dimensional experiments and study of historic precedents.
- 200. Graphic Communication (1). Lab. 3. (Open only to URP students.)**
A basic preparation in graphic techniques essential for communication of information and ideas for planning and urban design. Media and methods of mapping, diagramming, charting and sketching are surveyed, analyzed and applied.
- 201-202-203. Architectural Design (5-5-5). Lec. 2-2-2, Lab. 10-10-10. Pr., AR 110, 11 and AR 112. The Department reserves the right to refuse advancement to the student regardless of grades if, in the opinion of the faculty, the student does not exhibit real potential for the profession.**
Man and his needs as the primary influence in shaping space, form, and function: approach to a design methodology and understanding of structure.
- 231. Introduction To Landscape Architecture (3). Pr., sophomore standing.**
A survey of the art and practice of landscape architecture: its aims, scope, and philosophy.
- 232. Development of Landscape Architecture I (3). Pr., sophomore standing.**
An historical analysis of man's progress in designing land and outdoor space to meet varying needs in different times and places. Emphasis on religious, economic, cultural, social and political conditions, topography and climate as style determinants. Landscape design from ancient times to the first quarter of the nineteenth century. Lectures and collateral reading.
- 233. Development of Landscape Architecture II (3). Pr., sophomore standing.**
An historical analysis in continuation of AR 232 but may be taken separately. The impact of technological advance on the design of outdoor space. The shift from private to public works and the development of landscape architecture as an instrument of service in the public welfare. Lectures and collateral reading.
- 261-262-263. History and Theory of Architecture (3-3-3). Pr., sophomore standing. Must be taken in sequence.**
The development of architecture from ancient times through contemporary examples. The cultural and social milieu, as well as the technology of each period will be investigated to better understand the basic determinants of architectural form. Composition of architectural space, town planning, and landscape architecture will be considered. Illustrated lectures, readings, drawings, and reports.

- 301-302-303. Architectural Design (5-5-5). Lab. 15-15-15. Pr., a student must receive a grade of "C" or higher in AR 201, 202, and 203, to be admitted to AR 301. The department reserves the right to refuse advancement to the student regardless of grades if, in the opinion of the faculty, the student does not exhibit real potential for the profession.**

Analysis and solution of building design problems of moderate complexity; emphasis on environmental considerations and introduction of building systems.

- 320. Photography I (3). Pr., knowledge of basic photography, consent of instructor.**

An exploration via photography emphasizing an individual subjective approach to physical surroundings.

- 321. Photography II (3). Pr., AR 320, consent of instructor.**

Development of individual photographic skills and insights into understanding of surroundings.

- 340. Design Study Techniques. Lab. 4. (No credit.)**

Remedial work in development of techniques for quick sketch perspectives, delineation, and presentation drawings. Required of third or fourth year students who, in the opinion of the faculty, need additional experience to improve their ability to communicate design ideas. Offered on S-U (Satisfactory-Unsatisfactory) basis only.

- 360. Appreciation of Architecture (3). General elective. Pr., sophomore standing. (Not open to AR and ID students.)**

Architectural development with particular attention to American and contemporary examples. Illustrated lectures, reading, essays.

- 370. Spaces for Living (3). General elective. Pr., 3rd year standing. (Not open to AR and ID students.)**

Contemporary concepts of design, spatial organization, materials, furnishing, and gardens in relation to all major types of residential architecture. Illustrated lectures, readings, reports.

- 401. Architectural Design (5). Lab. 15. Pr., AR 303, Coreq., BSC 315.**

Buildings of advanced complexity focusing attention on research, analysis and programming methodology; the building complex and urban design considerations.

- 402. Architectural Design. (5). Lab. 15. Pr., AR 401, 475.**

Studio exercises deal primarily with design problems on a community scale and are conceived to facilitate the application of principles and techniques introduced in the prerequisite planning courses.

- 403. Architectural Design (5). Pr., AR 402.**

Buildings of advance complexity focusing attention on research, analysis and programming methodology; the building complex and urban design considerations.

- 435. Art and Architecture Seminar (3). Pr., 4th year standing.**

Readings, discussions, and projects on the relation of the graphic and plastic arts to architecture.

- 445. Architectural Technology I (4). Pr., AR 403.**

Conceptual and applied studies of the influence of technical systems on architectural design. Energy collection and conservation; structural, mechanical, electrical, waste removal and vertical transportation systems; special construction methods, life safety. Lectures, seminars, projects.

- 446. Architectural Technology II (4). Pr., AR 445.**

Continuation of AR 445. Conceptual and applied studies of technological aspects of architectural practice. Integration of design and technological factors: construction materials, manual and automated information systems. Lectures, seminars, research, projects.

- 447. Architectural Technology Thesis (8). Pr., AR 446.**

Special study of one or more topics, issues and/or problems significant to the technological aspects of modern architectural practice. Subject will be at the choice of the candidate and as approved by the faculty committee. Candidate must make documentary and oral presentations to staff and guest specialists.

- 460. The Architect and Society (3). Pr., 4th year standing.**

The social, economic, and political factors which have influenced the contemporary expression of architectural design and practice. Analysis of great works and philosophies which led the way to new approaches in design. Appreciation of aesthetics and function as applied to form. Lectures, outside reading and reports.

- 461. Seminar in Interdisciplinary Concepts (3). Pr., 3rd year standing.**

Seminar investigating the interrelationships between architecture and the other disciplines, especially the biological sciences. Key words like module, rhythm, and structure penetrate disciplinary boundaries and enable us to fabricate unifying webs among many different matrices.

- 464. Site Planning (5). Lec. 2, Lab. 9. Pr., 3rd year standing.**

An introduction to the art of site planning, an exposition of its principles, and applications of its techniques.

- 465-466. Architectural Design (8-8). Lab. 16-16. Pr., AR 403.**

Advanced problem solving processes and synthesis of previous design experiences; consideration of total scope of professional concerns, from architectural detailing to community design.

- 467. Architectural Design (8). Lab. 16. Pr., AR 466, 499.**

The extensive development of an architectural problem of the student's choice, under direction of the Committee on Design. Drawings, models, details, and written explanations, oral and/or published presentation for jury consideration.

- 469. Lighting (3). Lecture 1, Lab. 2. Pr., junior standing.**
An introduction to lighting, principles and techniques as applied to design in architecture and interior design.
- 471-472. Professional Practice (3-3). Pr., 4th year standing.**
Procedure in architectural practice; construction methods, estimation of quantities and costs. Office organization; legal requirements; professional organizations and relations; civic responsibility, professional ethics.
- 474. Introduction To Urban Planning (3). Pr., 3rd year standing.**
A survey of urban planning history and theory: an examination of the basic forces, influences and practices shaping urban growth and development.
- 475. Urban Design (3). Pr., AR 474.**
Case studies seminar illustrating the building processes that shape cities and urbanize regions and the role of architectural and related design professions within these processes.
- 476. Seminar in Contemporary Concepts (5). Pr., AR 263.**
Seminar in the exploration of twentieth century ideas of the art and/or science of architecture, and theoretical bases for architectural design.
- 477. Seminar in Historical Problems (5). Pr., AR 263.**
Seminar open to students who have shown ability, initiative, and industry in developing individual projects. Research, reports, and drawings under supervision on approved topics.
- 478. Seminar in Technological Problems (3). Pr., 4th year standing.**
Seminar in current technological advances in the building industry and evaluation of their impact upon architecture.
- 479. Seminar in Architectural Literature (3). Pr., 4th year standing.**
A guided study and discussion of selected readings.
- 481. Computers in Architecture (3). Pr., 3rd year standing.**
Survey of existing and emerging techniques of computer utilization in architectural design, production, and management.
- 485. Architectural Management I (5). Pr., AR 471, 5th year standing. Coreq., MN 341.**
Philosophies, issues, methods and procedures involved in the planning of architectural business operations, marketing of architectural services, management of architectural design processes. Lectures, case studies, research, problems.
- 486. Architectural Management II (5). Pr., AR 485. Coreq., MN 342.**
Continuation of AR 485. Philosophies, issues, methods and procedures involved in the management of architectural personnel, financial management of architectural operations, initiation of an independent architectural practice. Lectures, case studies, research, problems.
- 487. Architectural Management Thesis (8). Pr., AR 486.**
Special study of one or more topics, issues and/or problems significant to the management of modern architectural firms. Subject will be at the choice of the candidate and as approved by the Faculty Committee. Candidate must make documentary and oral presentations to staff and guest specialists. Candidate will also be expected to defend project.
- 495. Special Problems. Credit to be arranged up to 5 hrs. Pr., 3rd year standing.**
Development of an area of special interest through independent study. May be a group or team effort under direction of the faculty and with prior approval of the head of the Department. Evaluation of the work will be faculty jury. May be taken more than one quarter.
- 499. Design Research (2). Pr., AR 465.**
The selection and comprehensive programming of a terminal problem in architecture to be executed in AR 467.

COURSES OFFERED TO GRADUATE STUDENTS AND OTHERS BY PERMISSION

- 601. History and Theory of Planning (5). Pr., AR 474 or equivalent and graduate standing or consent.**
The historical development of cities and urban regions is examined with particular emphasis on the interaction of their dynamic and structural elements. The impact of the planner and the planning process on shaping public policy and influencing private developmental decision-making is examined.
- 615. Current Planning Issues (3). Pr., graduate standing or consent.**
Seminar examining topical issues in the fields of urban and regional planning.
- 620. Urban Planning Analysis (5). Pr., AR 601 and CE 603.**
Field application and involvement at the "city" or "neighborhood" level; data collection and analysis; agency and program identification; problem definition and recommendation of strategic plan; emphasis on real-world problems with an actual client.
- 680. Special Problems. Credit to be arranged up to five hours. Pr., graduate standing.**
Directed study in area of special interest. Arranged by student and adviser and approved by adviser. May be repeated for a maximum of up to ten hours.

Interior Design (ID)**Courses specifically required in the Interior Design curriculum**

- 215. Elements Of Interior Design (3). Lec. 3. Pr., AR 112.**
The profession of interior design including basic theory of interior design principles, aesthetics, and design concepts. Lectures, reading and discussions.
- 216. Elements Of Interior Design (3). Lec. 1. Lab. 3.**
Graphic drawing of interior spaces and related architectural design solutions. Lab projects involve development of delineation skills and techniques in graphic presentations.
- 217. Elements Of Interior Design (3). Lec. 1. Lab. 3.**
Basic drafting techniques and skills in relation to development of architectural working drawings required in the construction of interior spaces and equipment.
- 305-306-307. Interior Design (5-5-5). Lab. 15-15-15. Pr., AR 203. Admission upon recommendation of the Committee on Design.**
Analysis and solution of interiors of moderate complexity, with emphasis on domestic and commercial problems. Research, discussion, drawings, models.
- 365-366. Period Interiors (5-5).**
The development of interior spaces, furniture, fabrics, and accessories from pre-Renaissance to 1900. Illustrated lectures, readings, reports, and field trips.
- 367. Contemporary Interiors (5). Lec. 2. Pr., AR 366.**
The fundamental aspects of interior design, spatial order and characteristics, furniture and fabric design, from 1900 to date. Illustrated lecture, readings, reports.
- 405-406. Interior Design (5-5). Lec. 2-2, Lab. 9-9. Pr., AR 307. Admission upon recommendation of the Committee on Design.**
Analysis and solution of interiors of advanced complexity, with emphasis on institutional and public problems. Research, discussions, drawings, models.
- 407. Interior Design (7). Lec. 2, Lab. 15. Pr., AR 406.**
The development of a major design problem under the direction of the Committee on Design. Drawings, models, details; oral presentation for jury consideration.
- 408. Interior Design Research (2). Lec. 1, Lab. 3. Coreq., AR 406.**
The selection and comprehensive programming of a terminal problem in interior design to be executed in AR 407.
- 441. Professional Practice (3). Lec. 1, Lab. 3.**
Office procedure and methods for interior designers; the techniques and execution of working drawings for buildings, cabinetry and interior details; specification. Discussions, drawings, inspections, reports.
- 495. Special Problems. Credit to be arranged up to 5 hrs. Pr., 3rd year standing.**
Development of an area of special interest through independent study. May be a group or team effort under direction of the faculty and with prior approval of the department head. Evaluation of the work will be faculty jury. May be taken more than one quarter.

Industrial Design (IND)

- 210. Industrial Design (6). Lec. 2, Lab. 12. Pr., sophomore standing. Admission only upon recommendation of the Committee on Design (1.00 overall).**
Visual communication. Perception theory, design fundamentals; color, figure organization, movement and balance, proportion and rhythm.
- 211. Industrial Design (6). Lec. 2, Lab. 12. Pr., IND 210 and consent of instructor.**
An extension of principles encountered in Industrial Design 210. A study and analysis of Industrial Design Fundamentals.
- 212. Industrial Design (6). Lec. 2, Lab. 12. Pr., IND 211, and consent of instructor.**
Structural and functional relationship of design elements; convenience, utility, safety, maintenance.
- 221. Materials & Technology (5). Lec. 5. Pr., sophomore standing.**
The properties and use of various materials in manufacture and a study of the machine and tool processes used by industry. Survey from the Designer's viewpoint.
- 222. Technical Illustration (5). Lec. 5. Pr., sophomore standing.**
Axonometric drawing, perspective, and freehand graphics, as used by Industrial Designers.
- 223. Industrial Design Methods (5). Lec. 5. Pr., sophomore standing.**
The methods and organizational procedures employed in the analysis and solutions of design problems. Survey of philosophies and theories of design.
- 307. Anthropometry (5). Lec. 5. Pr., sophomore standing.**
Survey and introduction to the field of body measurements and movements in relation to Design.
- 308. Design Workshop (5). Lec. 3, Lab. 6. Pr., IND 210, TS 111.**
Modelmaking and creative modeling. Study Models, Presentation Models, Mock-ups, Prototypes.
- 309. Design Communication (5). Lec. 5. Pr., IND 222.**
Experiments in visual thinking and modeling.

- 310. Industrial Design (6). Lec. 2, Lab. 12. Pr., IND 212, 222, 223, TS 105. Admission only upon recommendation of Committee on Design. (1.00 overall and 1.33 from IND 210, 211, 212.)**
Design of machines and instruments. Arrangements of elements in systems.
- 311. Industrial Design (6). Lec. 2, Lab. 12. Pr., IND 310, PS 204.**
Design of domestic and office equipment.
- 312. Industrial Design (6). Lec. 2, Lab. 12. Pr., IND 311.**
Exhibition and packaging problems.
- 410. Industrial Design (6). Lec. 2, Lab. 12. Pr., IND 312, 307, 308, 309.**
Industrialized building. Housing systems produced by industrial means.
- 411. Industrial Design (6). Lec. 2, Lab. 12. Pr., IND 410. Admission only upon recommendation of Committee on Design. (1.25 overall and 1.50 from IND 310, 311, 312, 410.)**
Design or re-design of products and systems of advanced complexity.
- 412. Industrial Design Thesis (6). Lec. 2, Lab. 12. Pr., IND 411. Admission only upon recommendation of Committee on Design.**
A project involving all design phases; project of the student's own selection and approved by the Committee on Design. Presentation of graphics, models and written explanations, and oral presentation before a Design Jury. The thesis material will be retained by the Department for one year.
- 415. History of Industrial Design I (5). Pr., IND 212.**
Design from the first Industrial Revolution to the present, with emphasis on the relation between design and science, art, technology, and the humanities.

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- 516. History of Industrial Design II (5). Lec. 5**
Design from the beginning of artifacts to the first Industrial Revolution, with emphasis on the relation between design and sciences, art, technology, and the humanities.
- 585. Seminar in Industrial Design (5). Lec. 5. Pr., 4th year standing.**
Development of individual projects. Research, design, reports, on approved topics. May be repeated for a maximum of ten hours upon approval of Committee on Design.
- 586. Case Studies in Design (5). Lec. 3, Lab. 6.**
Design projects undertaken by industry will be studied by examination of artifacts and records, by interviews with professionals responsible for the phases of the projects, and by class discussions of this data and its implication. Focus on the socio-cultural relevancy of the artifacts.

GRADUATE

Individual courses available to graduate students in other fields.

- 601-602. Principles of Design (5-5). Lec. 2, Lab. 9.**
The communication principles of form qualities, with emphasis of these principles to the technical and human factors of artifacts, and to the human visual environment.
- 605. Design Management (5). Lec. 3, Lab. 6.**
The Industrial Design project management and development with emphasis on the interrelational management concepts of research, product planning, production and marketing.
- 606. Human Factors in Design (5). Lec. 3, Lab. 6.**
A theoretical and empirical examination of human factors (anthropometrics, Biotechnology, Engineering Psychology, Behavioral Cybernetics, Ergonomics) as applied to man-machine environment systems.
- 608-609. Aesthetics in Design (5-5). Lec. 3, Lab. 6.**
Aesthetics in the context of the designed environment encompassing such topics as: Non-verbal communication; object language and semiotics; gestalt and perception systems; information aesthetics and consumer product safety.
- 610. Design Theories (5). Lec. 3, Lab. 6.**
An examination of Design Theories and Philosophies as related to technical artifacts in man-machine systems. Comparative studies of unifying theories in Art, Science, Design, Technology and the Humanities.
- 611-612. Design Methodology (5-5). Lec. 3, Lab. 6.**
Industrial Design methodologies and scientific methods employed in research, analysis, synthesis and evaluation in comprehensive design problems. Emphasis on creativity and innovation.
- 613-614. Systems Design (5-5). Lec. 2, Lab. 9.**
Systems approach and interdisciplinary team work to Design problems, inquiries into details of sub-systems, components, and parts, with emphasis on the relation of the performance of technical systems to optimal human factor effects.
- 620-621-622-623. Industrial Design (5-5-5-5). Lec. 1, Lab. 12.**
Synthesizing studies in research, analysis and application based on an interdisciplinary concept. The project content is according to the student's interest from one or several of the following design areas: Product Design, Industrialized Housing, Package Design, Corporate Communications, Transportation Design, Exhibition Design and Systems Implementation. Emphasis on the relation of products and systems to those who use them.

699. Research and Thesis. Credit to be arranged.

May be taken more than one quarter.

Art (AT)

Professors Abney, Hiers, *Head*, Sykes, and Williams

Associate Professors Bost, Hatfield, Hobbs, Olson, Ross, and Woodham

Assistant Professors Berg, Collier Dugas, Kieffer, Skelton,

Swanson, Taugner, and Walls

Instructor Mitchell

111. Fundamentals (5). Lec. 2, Lab. 9.

Mechanical linear perspective.

112. Fundamentals (5). Lec. 2, Lab. 9.

Representational drawing. Linear construction, proportion, freehand perspective, chiaroscuro, surface treatments.

113. Fundamentals (5). Lec. 2, Lab. 9. Pr., AT 111, 112.

Interpretive drawing. Emphasis on creativity, composition and pictorial organization.

121. Fundamentals (5). Lec. 2, Lab. 9.

Plastic elements. Relationship of the arts. Problems in basic design.

122. Fundamentals (5). Lec. 2, Lab. 9.

Basic three-dimensional organization. Clay and other media.

123. Fundamentals (5). Lec. 2, Lab. 9. Pr., AT 121, 122.

Advanced application of principles encountered in AT 121 and AT 122.

171. History of World Art (3). Lec. 3.

A survey of world art history from Paleolithic through Gothic art.

172. History of World Art (3). Lec. 3.

A survey of world art history from the Renaissance through Impressionism.

173. History of World Art (3). Lec. 3

A survey of world art history from Post-Impressionism through contemporary art.

211. Basic Figure Drawing (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172, 173. Open to VA majors only.

Drawing in various media emphasizing a subjective approach to the human figure as form and as a compositional element.

212. Figure Construction (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172, 173. Open to VA majors only.

Lectures deal with form, function and operation of skeletal and muscular parts of the body. Drawing from casts, models, and skeleton.

221. Graphic Processes (5). Lec. 3, Lab. 6. Pr., AT 113, 123, 171, 172, 173.

Lettering, typography, printing processes, photomechanical reproduction, copy-fitting, paper manufacture and usage, related subjects.

222. Design Systems (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172, 173.

Systematic approaches to the process of creative problem solving in areas of visual organization.

231. Oil Painting (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172, 173.

Techniques and properties of the medium. Objective and subjective handlings as a further extension and application of the visual elements.

232. Transparent water color (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172, 173.

Techniques and properties of the medium. Objective and subjective handlings as a further extension and application of the visual elements.

241. Relief Printmaking (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172, 173.

Relief print media. Woodcut, linoleum cut and related techniques.

242. Intaglio Printmaking (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172 and 173.

Intaglio print media. Etching, engraving and related techniques.

251. Modeling/Construction (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172 and 173.

Three-dimensional expression. Modeling and Construction techniques emphasized.

252. Wood/Stone Sculpture (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172, 173 and 251.

Three-dimensional expression. Wood and Stone techniques emphasized.

301. Elementary School Art (5). Lec. 3, Lab. 6. Pr., junior standing. Cannot be taken for credit by VA majors.

An introduction to design principles and elements. The theory of teaching art, methods and materials especially related to elementary school art.

- 302. Secondary School Art (5). Lec. 3, Lab. 6. Pr., junior standing. Cannot be taken for credit by VA majors.**
An introduction to design principles and elements. The theory of teaching art methods and materials especially related to secondary school art.
- 313. Figure Drawing (5). Lec. 2, Lab. 9. Pr., AT 212. Open to VA majors only.**
Drawing from the model in various media, with emphasis on construction, interpretation, and expression.
- 314. Advanced Drawing I (5). Lec. 2, Lab. 9. Pr., AT 313, and 1.0 average in Group A Drawing, junior standing. Open to VA majors only.**
Advanced drawing with optional media and subject idea. Development of student's individual style and main potential.
- 323. Layout (5). Lec. 2, Lab. 9. Pr., AT 221, 222.**
Applied problems in advertising and editorial layout. Fundamentals of graphic design.
- 324. Visual Communications I (5). Lec. 2, Lab. 9. Pr., AT 222, 323, 313, junior standing. Open to VA majors only.**
The study and application of communicative procedures and skills necessary to convey messages by means of graphic presentation: an in depth study of problem solving. Development of student's individual style and main potential.
- 333. Opaque water color (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172, 173.**
Techniques and properties of the medium. Objective and subjective handlings as a further extension and application of the visual elements.
- 334. Advanced Painting I (5). Lec. 2, Lab. 9. Pr., AT 231, 232, 333, 313, and 1.0 average in Group A Painting, junior standing. Open to VA majors only.**
Advanced painting with optional media and subject idea. Development of student's individual style and main potential.
- 343. Planographic Printmaking (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172 and 173.**
Lithography. Methods and techniques of lithographic printing.
- 344. Advanced Printmaking I (5). Lec. 2, Lab. 9. Pr., AT 241, 242, 343, 313, and 1.0 average in Group A Printmaking, junior standing. Open to VA majors only.**
Advanced printmaking with optional media and subject idea. Development of student's individual style and main potential.
- 353. Metal Sculpture (5). Lec. 2, Lab. 9. Pr., AT 113, 123, 171, 172, 173 and 251.**
Three-dimensional expression. Metal and metal techniques emphasized.
- 354. Advanced Sculpture I (5). Lec. 2, Lab. 9. Pr., AT 251, 252, 353, 313, junior standing. Open to VA majors only.**
Advanced sculpture with optional media and subject idea. Development of student's individual style and main potential.
- 364. Illustration I (5). Lec. 2, Lab. 9. Pr., AT 231, 232, 333, 313, 323, and 1.0 average in Group A Drawing, Visual Design and Painting, junior standing. Open to VA majors only.**
Fundamentals of illustration. Successive lectures and problems on aesthetic and functional aspects.
- 371. Greek and Roman Art (3). Lec. 3. Pr., sophomore standing.**
A study and the analysis of Greek and Roman Art and architecture, influences exerted both on and by these particular art forms.
- 372. Renaissance Art (3). Lec. 3. Pr., sophomore standing.**
The analysis of Italian and Northern Renaissance art and architecture, and the influences exerted on both.
- 373. Modern Art (3). Lec. 3. Pr., sophomore standing.**
A concentrated analysis of the major art movements and artists of the twentieth century from Fauvism through contemporary art.
- 377. The Arts of China (3). Lec. 3. Pr., sophomore standing.**
A survey of Chinese art from the Neolithic period through the Ching Dynasty. Special attention is given to the bronze age cultures, Buddhist art, and great landscape painting of the Sung and later periods.
- 379. The Arts of Japan (3). Lec. 3. Pr., sophomore standing.**
A survey of Japanese art and architecture from prehistoric times to the Meiji Restoration, with emphasis on Buddhist influences from China as well as the development of indigenous art forms.
- 415. Advanced Drawing II (5). Lec. 2, Lab. 9. Pr., AT 314, junior standing.**
Advanced drawing with optional media and subject idea. Development of student's individual style and main potential.
- 416. Advanced Drawing III (5). Lec. 2, Lab. 9. Pr., AT 415, junior standing.**
Advanced drawing with optional media and subject idea. Development of student's individual style and main potential.
- 425. Visual Communications II (5). Lec. 2, Lab. 9. Pr., AT 324, junior standing.**
The application of communicative procedures and skills necessary to convey messages by means of graphic presentation: an in depth study of problem solving. Development of student's individual style and main potential.

- 426. Visual Communications III (5). Lec. 2, Lab. 9. Pr., AT 425, junior standing.**
The application of communicative procedures and skills necessary to convey messages by means of graphic presentation; an in depth study of problem solving. Development of student's individual style and main potential.
- 435. Advanced Painting II (5). Lec. 2, Lab. 9. Pr., AT 334, junior standing.**
Advanced painting with optional media and subject idea. Development of student's individual style and main potential.
- 436. Advanced Painting III (5). Lec. 2, Lab. 9. Pr., AT 435, junior standing.**
Advanced painting with optional media and subject idea. Development of student's individual style and main potential.
- 445. Advanced Printmaking II (5). Lec. 2, Lab. 9. Pr., AT 344, junior standing.**
Advanced printmaking with optional media and subject idea. Development of student's individual style and main potential.
- 446. Advanced Printmaking III (5). Lec. 2, Lab. 9. Pr., AT 445, junior standing.**
Advanced printmaking with optional media and subject idea. Development of student's individual style and main potential.
- 455. Advanced Sculpture II (5). Lec. 2, Lab. 9. Pr., AT 354, junior standing.**
Advanced sculpture with optional media and subject idea. Development of student's individual style and main potential.
- 456. Advanced Sculpture III (5). Lec. 2, Lab. 9. Pr., AT 455, junior standing.**
Advanced sculpture with optional media and subject idea. Development of student's individual style and main potential.
- 465. Illustration II (5). Lec. 2, Lab. 9. Pr., AT 364, junior standing.**
Fundamentals of fashion illustration. Successive lectures and problems on aesthetic and functional aspects.
- 466. Illustration III (5). Lec. 2, Lab. 9. Pr., AT 465, junior standing.**
Fundamentals of technical illustration. Successive lectures and problems on aesthetic and functional aspects.
- 498. Honors Project (5). Pr., Completion of Group B Studio in area of concentration and a 2.0 cumulative grade point average, or by special permission.**
A terminal honors project initiated and executed independently by the student and accompanied by a written analysis and evaluation. Both studio and written work will be defended orally by the student before a faculty group. Grading will be made on a satisfactory-unsatisfactory basis rather than a letter grade. Professional quality color slides of the project work must be presented to the Art Department before the student is cleared for graduation.
- 499. Terminal Project in Advanced Studio (5). Pr., Completion of Group B Studio in area of concentration and a 1.0 cumulative grade point average.**
A directed terminal studio project with student's choice of subject and medium. The project will be exhibited and a committee will award a letter grade. Professional quality color slides of the project work must be presented to the Art Department before the student is cleared for graduation.

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- 501. Art in Education (5). Lec. 3, Lab. 6. Pr., senior standing. Cannot be taken for credit by VA majors.**
Lectures, reading and research concerning principles and objectives of pertinent phases of Art for the purpose of understanding their significance in teaching at all levels. Emphasis is placed upon creativity rather than technical skill in laboratory experimentation.
- 510. Seminar in Advanced Drawing (5-5)*. Pr. AT 416, senior standing.**
Open to students who have shown ability, initiative, and industry in carrying out individual projects. Research in approved areas in Advanced Drawing.
- 520. Seminar in Advanced Design (5-5)*. Pr., AT 426, senior standing.**
Open to students who have shown ability, initiative, and industry in carrying out individual projects. Research in approved areas of Advanced Design.
- 530. Seminar in Advanced Painting (5-5)*. Pr., AT 436, senior standing.**
Open to students who have shown ability, initiative, and industry on individual projects. Research in approved areas in Advanced Painting.
- 540. Seminar in Advanced Printmaking (5-5)*. Pr., 446, senior standing.**
Open to students who have shown ability, initiative, and industry on individual projects. Research in approved areas of Advanced Printmaking.
- 550. Seminar in Advanced Sculpture (5-5)*. Pr., AT 456, senior standing.**
Open to students who have shown ability, initiative, and industry on individual projects. Research in approved areas in Advanced Sculpture.
- 560. Seminar in Advanced Illustration (5-5)*. Pr., AT 466, senior standing.**
Open to students who have shown ability, initiative, and industry on individual projects. Research in approved areas in Advanced Illustration.

- 570. Independent Study in Art History (5-5)*. Pr., AT 371, 372, 373, senior standing.**
Open to students who have shown ability, initiative, and industry on individual projects. Research, drawings and reports on historical topics under supervision.

GRADUATE

- 605-606-607-608-609-610-611-612. Graduate Art Studio (5-5-5-5-5-5-5-5). Lab. 15-15-15-15-15-15-15-15.**

Advanced programs of creative work in the student's elected field.

- 621-622-623. Graduate Internship in Studio Teaching (5-5-5). Pr., unanimous approval of graduate faculty.**

Supervised projects in studio teaching.

- 641-642-643-644. Graduate Research in Art Problems I, II, III, IV (5-5-5-5).**

Research on approved topics in Art History. Conference and reports.

- 651-652-653. Graduate Internship in Studio Practice (5-5-5).**

Supervised projects on studio experience in areas of painting, printmaking, sculpture or visual design.

- 699. Research and Thesis. Credit to be arranged. May be taken more than one quarter.**

A major art problem consisting of a sustained single project or a logical sequence of shorter projects. The candidate will be required to conceive and execute a work or works exhibiting pronounced creative ability and technical proficiency. Upon recommendation of the major professor, a written essay may be required to accompany the project.

Aviation Management (AM)

Professor Pitts, *Head*

Associate Professors Decker, Fradenburg, and Kiteley

Assistant Professor Callan

Flight Instructors Carter and Ripley

- 200. Aerospace Problems Analysis (5). Pr., MH 161.**
Application of basic mathematical and physical concepts to problems in the aerospace industry.
- 201. Elementary Aeronautics (5).**
Physiology of flight, subsonic and supersonic aerodynamics and stability and control, aircraft performance, basic propulsion, structure, and maintenance management are studied. Course designed for students in the aviation management curriculum and includes the option of participating in orientation flights.
- 202. Aerospace History (3).**
Significant events and accomplishments in man's attempts to move through air and space. Emphasis is placed on technological developments.
- 214. Flight Orientation (1). Lab 3.**
Basic flight experience course for non-pilots to familiarize aviation majors, engineers, teachers and other students desiring a limited exposure to flight. Course includes ground discussion, experience in flight simulator, and aircraft flight time. Special Fee. Course may be repeated up to three times.
- 215. Principles of Private Flight—Ground (3). Lec. 3.**
General introduction and preparation for the FAA private pilot written examination. Topics: theory of flight, aircraft and engines, regulations, and aircraft operation and performance.
- 216. Completion of Private Flight, Ground (3). Lec. 3. Pr., AM 215 or instructor's consent.**
Completion of subjects required in preparation for the FAA private pilot written examination. Topics of meteorology, navigation, safety, medical factors of flight and flight maneuvers.
- 217. Introduction to Flight Training (1). Lab. 3. Coreq., AM 215 or instructor's consent.**
The first step towards the Private Pilot Flight Test. Dual and solo flight instruction and discussion for solo flight in local area. Special Fee.
- 218. Private Pilot Flight Training (1). Lab. 3. Pr., AM 215. Coreq., 216, 217 or instructor's consent.**
Dual and solo flight instruction and discussion to complete the requirements for a FAA Private Pilot Certificate. Special Fee.
- 304. Meteorology (5). Lec. 4, Lab. 3. Pr., sophomore standing.**
Elementary meteorology including a basic understanding of the atmosphere, measurement of meteorological elements and effects of these on the lower atmosphere. Designed for students who require a general knowledge of atmospheric science. Not open to aviation management students.

* (5-5) may be repeated for maximum of 10 hours.

- 305. Aviation Meteorology (5). Lec. 4, Lab. 3. Pr., PS 206.**
Basic meteorology as it applies to the operation of aircraft, with emphasis on observation of weather elements and the interpretation of flight planning weather information.
- 308. Federal Aviation Regulations (3). Pr., sophomore standing.**
All regulations concerning airmen, aircraft, air agencies, operation and traffic rules.
- 309. Reciprocating Engines and Propulsion Principles (3). Pr., PS 206.**
Introduction to basic laws of operation and types of power plants. Detailed coverage of reciprocating engines including principles of operations, major components and important features.
- 310. Jet Propulsion (3). Pr., AM 309.**
Review of basic laws as applied to jet propulsion. Detailed study of jet propulsion including principles, components, and major features. Also includes an introduction to propulsion systems used for spacecraft.
- 312. Guidance and Control Fundamentals (5). Pr., PS 206.**
Basic principles of aircraft and spacecraft guidance and control.
- 313. Aerospace Vehicle Systems (5). Pr., PS 206.**
Design, use and function of typical hydraulic, mechanical and electrical systems used on aircraft, missiles and space vehicles as on preparation for the FAA commercial written examination.
- 322. Commercial Flight Training I (1). Lab. 3. Coreq., AM 321 or instructor's consent.**
Continuation of flight training toward a Commercial Pilot Certificate with emphasis on the development of precision and accuracy in all intermediate and advanced flight maneuvers. Special Fee.
- 323. Aircraft Operation and Performance (3). Lec. 2. Lab. 3. Pr., AM 321 or instructor's consent. Fall.**
Principles of aircraft performance and operations, including powerplants, aircraft systems and equipment, and advanced flight maneuvers required for commercial pilots.
- 324. Commercial Flight Training II (1). Lab. 3. Coreq., AM 323 or instructor's consent.**
Continuation of flight training toward a Commercial Pilot Certificate with emphasis on cross-country, night and instrument flying. Special Fee.
- 325. Principles of Instrument Flight (3). Lec. 2, Lab. 3. Pr., AM 323 or instructor's consent. Winter.**
Instruments, FAA regulations, air traffic control procedures, radio navigation, meteorology, and aircraft operation and performance as applied to instrument flying preparation for the FAA Instrument Pilot Written Examination.
- 326. Commercial Flight Training III (1). Lab. 3. Pr., AM 321 and 323. Coreq., 325 or instructor's consent.**
Continuation of flight training for the Commercial Pilot Certificate with training in transition to complex aircraft. A continuation of instrument and night instruction and a review of all maneuvers for the commercial flight test. Special Fee.
- 327. Commercial Flight Training IV (1). Lab. 3. Pr., AM 326. Coreq., 325 or instructor's consent.**
Completion of FAA requirements for an unrestricted Commercial Pilot Certificate. Special Fee.
- 401. Aeronautical Seminar (1). Pr., junior standing.**
Special problems and current status of the aerospace industry.
- 403. General Aviation Management (3). Pr., junior standing.**
An overview of general aviation and its impact and interaction with the total aviation industry including a study of the various users, the suppliers and service organizations, the aircraft and facilities and regulatory framework.
- 404. General Aviation Operations (3). Lec. 2, Lab. 3. Pr., AM 403. Fall and Spring.**
Current principles and practices in commercial aviation operations including organization, sources of revenue, functions, operation and typical problems. Laboratory assignments are provided through the school of Aviation.
- 407. Air Transportation (5). Pr., AM 202, MT 472.**
The political, economic, military, social and environmental significance of air transportation; development and present status of mail, cargo, passenger, general aviation transportation and airports. Includes study of the economics of air transportation and the causes of aircraft noise and engine emission and their impact on the industry and the environment.
- 409. Aerospace Legislation (3). Pr., AM 407.**
The process of enacting legislation; the current Federal statutes pertaining to aerospace and the regulatory agencies established by those statutes. The control and regulation of aerospace activities by state and local governments and a study of typical organizations and actions taken by these agencies, including zoning and airspace easements. International control of air transportation, the agreements and regulatory bodies exercising such control. Includes case studies of application of responsibilities by organizations at all levels.
- 413. Airport Management (3). Pr., junior standing.**
Current practices in management of a civil public airport, including organization, functions, operations, sources of revenue, funding, maintenance and administration.

- 414. Airport Planning (3). Pr., AM 413. Spring.**
Principles and procedures pertaining to planning airport facilities required to meet the immediate and future air transportation of a community or region.
- 417. Airline Operations (5). Pr., AM 409 or instructor's consent.**
Airline organizational theory and managerial practices; financial structure and sources of capital; sales and reservations; dispatching and flight operations; equipment selection and aircraft scheduling; personnel relations; research; public relations.
- 418. International Airlines (3). Pr. AM 409, junior standing. Spring.**
International foreign fare carriers, influences of ICAO and IATA, national ownership, determinants of power, operational and management practices, routes and fares.
- 419. Air Traffic Control (5). Lec. 4, Lab. 3. Pr., AM 312, junior standing.**
All facilities used in controlling air traffic with special emphasis on control center and control tower operation.
- 420. Air Cargo Operations (3). Pr., junior standing. Spring.**
A study of domestic and international air cargo operations with emphasis on cargo economics, equipment, domestic and international regulatory activities, agents, operational techniques, systems, and problems.
- 421. Principles of Instrument Flight (3). Lec. 2, Lab. 3. Pr., AM 323 or instructor's consent. Spring.**
Instruments, FAA regulations, air traffic control procedures, radio navigation, meteorology, and aircraft operation and performance as applied to instrument flying preparation for the FAA Instrument Pilot Written Examination.
- 422. Instrument Flight Training (1). Lab. 3. Pr., Commercial Pilot Certificate or instructor's consent.**
Flight and flight simulation instruction in the techniques of instrument flying in preparation for the FAA Instrument Pilot Rating. Special Fee.
- 427. Multi-Engine Training I (1). Lab. 3. Pr., a valid private or commercial pilot certificate.**
Instruction in the methods and techniques of multi-engine aircraft pilotage. Sufficient ground and flight instruction is given to qualify for the FAA pilot rating of Multi-Engine-Land. Special Fee.
- 428. Principles of Flight Instruction (3). Pr., AM 327. Fall.**
The principles of teaching as applied to instructing, analyzing, and evaluating flight students with emphasis on preparation for the FAA Flight instructor's Written Examination.
- 429. Flight Instructor Training (1). Lab. 3. Coreq., AM 428 or instructor's consent.**
Discussion, instruction, and arranged practice in flight instruction in preparation for the FAA Flight Instructor Certificate. Special Fee.
- 431. Multi-Engine Flight Training II (1). Lab. 3. Pr., AM 327 or 422, 427. Fall.**
Instrument and night operations to develop flight proficiency in multi-engine aircraft in actual air transportation operation. Includes ten hours experience as co-pilot. Course may be repeated once.
- 432. Principles of Professional Flight (3). Lec. 3. Pr., AM 305, 325 or 421.**
The principles and practices for flight crew qualifications in the areas of aircraft performance, IFR operations, high altitude meteorology, and FAR Parts 121 and 135.
- 433. Transport Aircraft Flight Training (2). Lec. 1, Lab. 3. Pr., AM 327 or 422, 427.**
Includes dual instruction in instrument techniques, emergency operation, and performance of multi-engine aircraft. Suitable for preparation for the flightcheck for an Airline Transport Pilot certificate if otherwise qualified. Special Fee.
- 491. Special Problems (Variable credit 1-5). Pr., department approval.**
Individual student endeavor under faculty supervision involving special problems of an advanced nature in aviation management. May be taken more than once with a maximum credit of 10 hours.

ADVANCED UNDERGRADUATE AND GRADUATE

- 551. Aerospace Science (5).**
A non-technical presentation of the principles and fundamentals of aviation and aerospace science, related systems, and related equipment. The course is primarily designed for students who require a general knowledge of aviation or aerospace science. It will include lectures by aerospace authorities and visits to aeronautical and aviation facilities. Not open to engineering students.

Biology (BI)

Coordinator and Associate Professor Mason

For other staff and biology courses, see sections for Botany and Microbiology and Zoology-Entomology.

- 101. Principles of Biology (5). Lec. 4, Lab. 2. All quarters.**
Integrated principles of biology, emphasizing structure and function of cells, reproduction, heredity, ecology, and evolution.

102. Plant Biology (5). Lec. 4, Lab. 3. Pr., BI 101. All quarters.

The morphology, physiology, relationships, distribution, and importance of plants.—Credit will not be allowed for both BI 102 and 104.

103. Animal Biology (5). Lec. 4, Lab. 3. Pr., BI 101. All quarters.

The morphology, physiology, relationships, distribution, and importance of animals.—Credit will not be allowed for both BI 103 and 104.

104. Biology in Human Affairs (5). Lec. 5. Pr., BI 101. All quarters.

Application of biological principles to an understanding of man as an organism and as a member of an ecosystem. Credit will not be allowed for BI 104 and 103 or for BI 104 and 102.

Botany and Microbiology (BY)

Professors Lyle, Head, Curl, D. Davis, N. Davis, Diener,

Gudauskas, Marshall, Patterson, and Truelove

Associate Professors Cody, Freeman, Rodriguez-Kabana, and Williams

Assistant Professors Blevins, Campbell, T. Davis, Goslin, V. Kelley, Peterson,

Shands, Weete, and Wilt

Instructor Golden

With few exceptions Principles of Biology, BI 101 and Plant Biology, BI 102, are prerequisite to all courses in this department. For a description of these and other general biology courses see the section for Biology (above).

100. Introductory Microbiology (5). Lec. 5. Fall, Winter, Spring.

Presentation of the broad scope of microbiology with emphasis on those aspects which directly affect humans. The roles of bacteria, fungi, and viruses in fields like environmental protection, public health, food technology, and agriculture are given special attention. Designed for non-biology and non-microbiology majors. Credit in any other general microbiology course precludes credit in this one.

215. Introductory Biological Statistics (5). Lec. 4, Lab. 2. Pr., MH 160. Fall, Winter.

Elementary statistics as applied to agriculture and biology including an introduction to empirical frequency distributions, descriptive statistics, elementary probability, sampling, estimation, testing hypotheses, linear regression, correlation, and the analysis of variance.

216. Introductory Biological Computations (3). Pr., sophomore level.

An introduction to the use of the computer for agricultural and biological computations and data reduction. Introduction to FORTRAN programming and to effective and valid use of available program packages in biology.

300. General Microbiology (5). Lec. 3, Lab. 4. Pr., BI 101, CH 207. All quarters.

Fundamentals of microbiology including history of microbiology, cell structure, chemical composition, growth, nutrition, metabolism, genetics, classification, cultivation, and distribution of bacteria, viruses, rickettsiae, and fungi, also a discussion of the effects of chemical and physical agents on the growth of microorganisms.

302. Medical Microbiology (5). Lec. 3, Lab. 4. Pr., BI 101-102, CH 208. All quarters.

Etiology, epidemiology, immunity, identification and pathogenesis of microorganisms of medical importance to man.

306. Fundamentals of Plant Physiology (5). Lec. 3, Lab. 4. Pr., BI 102, CH 203 or 207 or equivalent.

General aspects of fundamental life processes of plants involving physiological, structural, and environmental relationships.

309. General Plant Pathology (5). Lec. 3, Lab. 4. Pr., BI 101-102. Winter, Spring.

Nature cause, and control of plant diseases illustrated by studies of the more common diseases of cultivated crops.

310. Forest Pathology (3). Lec. 1, Lab. 4. Pr., BI 101-102 or equivalent. Winter, Spring.

Diseases of forest and ornamental trees from seedling to maturity including cause, identification, prevention, and control; decay in timber and forest products. Field trips emphasize major tree diseases in Alabama.

446. Clinical Microbiology (5). Lec. 3, Lab. 4. Pr., BY 300, junior standing. Fall, Spring.

Isolation, cultivation, identification, classification and pathogenesis of infectious agents, including from clinical materials: Mycoplasma (PPL0), Rickettsiae, and Spinochaetes.

ADVANCED UNDERGRADUATE AND GRADUATE

501. Biological Statistics (5). Lec. 4, Lab. 2. Pr., MH 161. Fall, Winter, Spring.

Basic concepts of experimental statistics, distributions, confidence limits, tests of significance, analysis of variance, linear correlation and regression. For advanced undergraduates and as a beginning course for graduate students in biological sciences.

503. Microbial Taxonomy (5). Lec. 3, Lab. 4. Pr., BY 300. Winter.

International Code of Nomenclature of bacteria and viruses. The development of microbiological literacy; classification of taxa based on phylogeny, molecular and numerical concepts.

- 505. Introductory Mycology (5). Lec. 2, Lab. 6. Pr., BI 101-102 or equivalent. Fall.**
A systematic survey of the fungi with emphasis on morphology.
- 506. Systematic Botany (5). Lec. 3, Lab. 4. Pr., BI 101-102 or equivalent. Spring, Summer, Fall.**
Identification, classification, nomenclature, distribution and systematic relationship of the seed-bearing plants, utilizing primarily elements of the local flora as study material. The historical background, literature of plant taxonomy, and rules of nomenclature will be considered. Field trips will be made, including an overnight week-end field trip.
- 507. Salt Marsh Ecology (6). Lec. 4, Lab. 12. Pr., ten hours of biology including introductory botany. Summer.**
The biological aspects of local marshes; includes plant identification, composition, structure, distribution and development of coastal marshes. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Miss.
- 508. Marine Microbiology (7½). Lec. 5, Lab. 12. Pr., General Microbiology and advanced microbiology or consent of instructor. Summer.**
A general course designed to introduce the student to the role of microorganisms in the oceans and estuaries. Special emphasis will be placed on the study of bacteria and fungi. Lecture and laboratory work includes sampling procedures, taxonomy of marine bacteria, mineralization, microbial fouling, pollution, and diseases of marine animals. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
- 509. Marine Botany (6). Lec. 5, Lab. 12. Pr., Ten hours of biology, including introductory botany, or consent of instructor. Summer.**
Survey, based upon local examples, of the principal groups of marine algae and maritime flowering plants, involving their structure, reproduction, distribution, identification, and ecology. Restricted to participants in the Gulf Coast Research Laboratory Teaching Session.
- 510. Aquatic Plants (5). Lec. 2, Lab. 6. Pr., BI 101-102 or equivalent. Summer.**
Identification and study of those plants found in or associated with the fresh water features of Alabama. Emphasis will be on plants which have particular relationships to wildlife management or fish culture. Field trips will be taken, including week-end trip, and a plant collection is required.
- 511. Phycology (5). Lec. 2, Lab. 6. Pr., BI 101-102 or equivalent. Spring.**
The identification, growth, reproduction, distribution, evolution and economic importance of the algae. Field trips will be made, including an overnight week-end trip.
- 512. Advanced Plant Pathology I (5). Lec. 2, Lab. 6. Pr., BY 309 or equivalent. Spring, odd years.**
Techniques and methodology used in the study of plant pathogens, particularly fungi, bacteria, viruses, and nematodes, and the diseases they cause.
- 513. General Plant Ecology (5). Lec. 3, Lab. 4. Pr., BY 306. Fall and Spring.**
Natural vegetation, environment, and interrelationships between the two with primary emphasis on the Southeastern United States. Field trips will be made, including an overnight week-end trip.
- 514. Biological Microscopy, Microtechnique, and Photography (5). Lec. 2, Lab. 6. Pr., BI 102-103 or equivalent, consent of instructor. Fall.**
Various methods of tissue preparation for observation with the light microscope, including fixing, paraffin and plastic embedding, sectioning, general and cyto-chemical staining and mounting. Smear and squash techniques. Introduction to optical microscopy, macro- and microphotography. Techniques of developing, printing, enlarging, and copying for photographic illustration and lantern slide presentation.
- 515. Developmental Plant Anatomy (5). Lec. 3, Lab. 4. Pr., BI 101-102 or equivalent. Winter.**
Comparative anatomy of vascular plants with emphasis on structural and developmental relationships. A review of current anatomical, experimental, and ultra-structural research in plant anatomy.
- 516. Morphology of Land Plants (5). Lec. 3, Lab. 4. Pr., BI 101-102 or equivalent. Spring.**
Comparative morphology of the principal groups of land plants with emphasis on their structure, development, reproduction, and evolutionary relationships. Living and fossil members of the local flora will be used as study material. Field trips will be made.
- 519. Principles in Plant Disease Control (3). Lec. 2, Lab. 2. Pr., BY 309. Spring, even years.**
Designed to acquaint the student with such principles of plant disease control as protection, exclusion, eradication, and resistance. The control of important plant pathogens will be considered by each method. Emphasis will be placed on chemical control with antibiotics, fumigants, and fungicides.
- 525. Physiology of Fungi (5). Lec. 2, Lab. 6. Pr., BI 101-102. Winter, odd years.**
The physiology and chemistry of the nutrition, growth, and reproduction of fungi.
- 530. Plant Nematology (5). Lec. 2, Lab. 6. Pr., BY 309, BI 101 or consent of instructor. Winter, even years.**
Various roles of nematodes in relation to plant diseases caused by the nematodes and other pathogens. Identification of the plant-nematodes nature of pathogenicity; principles and practices of control; recent advances in phytonematology.
- 535. History of Selected Topics in Botany (3). Lec. 3.**
The events, times, and personalities that lead to our current understanding of selected aspects of Botany and allied disciplines.
- 540. Microbial Physiology (3). Lec. 3. Pr., BY 300, CH 203 or 207. Fall.**
Cellular structure, function, nutritional requirements, energy metabolism, growth cycles, active transport mechanisms, biosynthesis, and mutation and genetics.

- 540L. Microbial Physiology Laboratory (3). Lab. 6. Pr., BY 440. Winter.**
Laboratory experiments conducted on instrumentation, staining mechanisms, protoplast formation, cellular function, Warburg respirometry, Nephelometry, bioassay, U.V. light irradiation and photoreactivation, mutation, antibiotic sensitivity, and ultrasonic rupture of organisms.
- 541. Sanitary Microbiology (5). Lec. 3, Lab. 4. Winter, Spring. Pr., BY 300.**
Theory and application of fundamental principles of microbiology, ecology and biochemistry of microorganisms in water and sewage.
- 542. General Virology (5). Lec. 3, Lab. 4. Pr., BY 300, BY 302 or equivalent. Spring, Fall.**
The molecular biology of bacterial, plant, and animal viruses; pathogenesis, diagnosis, and cultivation.
- 543. Immunology (5). Lec. 2, Lab. 6. Pr., BY 302, consent of instructor. Spring, Winter.**
Immunobiology and immunochemistry of humoral and cellular mechanisms of immunity.
- 544. Microbiological Methods (5). Lec. 3, Lab. 4. Pr., BY 300. Spring, Fall.**
Theory and practice of analytical microbiology.
- 560. Special Problems (1-3). Pr., consent of instructor, senior standing. All quarters.**
A. Anatomy; B. Ecology; C. Morphology; D. Pathology; E. Physiology; F. Taxonomy; G. Applied Microbiology; H. Diagnostic Microbiology; I. Microbial Ecology; J. Microbial Physiology; K. Microbial Taxonomy. A student cannot register for more than 3 hours credit.

GRADUATES ONLY, MAJOR OR MINOR

- 601. Biological Statistics II (5). Lec. 4, Lab. 2. Pr., BY 401 or equivalent. Winter.**
Analysis of variance, randomized block, Latin square and split plot designs, factorials, analysis of covariance, and multiple regression.
- 602. Least Squares Analysis of Experiments (5). Lec. 4, Lab. 2. Pr., BY 501 and BY 601 or equivalent. Spring, even years.**
Analysis and interpretation of experimental data by least squares procedures; general linear models and hypotheses; weighted regression; irregular two-factor design.
- 603. Plant Morphogenesis (5). Lec. 3, Lab. 4. Pr., BY 306 and either BY 515 or 516. Spring.**
Recent advances in differentiation and the development of form, with special reference to higher plants. Experimental studies of cell, tissue, and organ development, and patterns of organization will be emphasized. The laboratory procedures will be largely experimental including time for discussion and for students to participate in individual and group experiments.
- 604. Advanced Plant Physiology I (5). Lec. 3, Lab. 4. Pr., BY 306 and 10 hours of organic chemistry. Fall.**
Molecular biology and plant metabolism; a correlation of the fine structures of the cell with metabolic pathways occurring therein.
- 605. Advanced Physiology II (5). Lec. 3, Lab. 4. Pr., BY 604 or equivalent. Winter.**
Water relations and mineral nutrition. Internal and external factors affecting the absorption, translocation, utilization, and loss of water and mineral elements by green plants.
- 606. Advanced Plant Physiology III (5). Lec. 3, Lab. 4. Pr., BY 604 or equivalent. Spring.**
Plant growth. A review of literature and laboratory methodology of plant physiological subject matter in the areas of plant growth regulators, mode of action of growth regulators, and factors affecting plant growth.
- 608. Advanced Systematic Botany (5). Lec. 2, Lab. 6. Pr., BY 506. Fall.**
Experimental and research aspects of the taxonomy of vascular plants. The literature, techniques and methodology relative to the identification and biosystematic classification of evolutionary units; intensive study of special groups of plants and the application of resultant data to specific taxonomic problems.
- 610. Advanced Microbial Physiology (5). Lec. 2, Lab. 6. Pr., BY 540, CH 518. Winter, odd years.**
Physiology of microorganisms; energy transfer mechanisms, metabolism, sexuality and mutation.
- 611. Ecology of Soil Fungi (5). Lec. 2, Lab. 6. Pr., BY 309 or equivalent, BY 505. Spring, even years.**
Quantitative and qualitative consideration of the microbial population of the soil. Relation of physical environment, antagonistic microorganisms, and higher plants on growth and survival of soil fungi. Emphasis will be on methodology for studying soil microflora and plant disease relationships.
- 613. Systematic Bacteriology (5). Lec. 2, Lab. 6. Pr., BY 303. Summer.**
Isolation, purification, and identification of bacteria; experimental application of international rules of nomenclature.
- 614. Plant Ecosystems (5). Lec. 3, Lab. 4. Pr., BY 513. Summer, even years.**
Plant ecosystems and the effects of current technology on these systems. Problems relating to pollution and maintaining a quality environment will be covered.
- 616. Cytology and Cytogenetics (5). Lec. 3, Lab. 4. Pr., ZY 300. Winter.**
Cell structure and function with emphasis on cell reproduction and factors contributing to the evolution of organisms.

- 617. Phytovirology (5). Lec. 3, Lab. 4. Pr., BY 309 or 310, BY 542. Winter, odd years.**
To acquaint students with viruses as plant pathogens and the diagnosis and control of diseases caused by them. Laboratory will involve methodology in the transmission, isolation, and characterization of viruses which infect plant.
- 618. Clinical Plant Pathology (5). Lec. and Lab. 8. Pr., BY 512 or equivalent or consent of instructor. Summer, even years.**
Identification, epidemiology, etiology, and control of the major diseases on various kinds of economic plants, to be selected on the basis of current needs of the students.
- 619. Advanced Plant Pathology II (5). Lec. 3, Lab. 4. Pr., BY 309 or equivalent. Summer, odd years.**
Biological significance of etiology, epiphytology, and host-parasite relations in plant diseases. Classical and current theory will be considered in relation to concepts and problems in plant pathology.
- 620. Chemical Weed Control (5). Lec. 3, Lab. 4. Pr., BY 306, BY 506, or AY 514. Summer, odd years.**
Application, mode of action, physiological relationships, recent advances, and special weed problems.
- 621. Industrial and Applied Microbiology (5). Lec. 3, Lab. 4. Pr., 10 hours of microbiology and 5 hours of biochemistry. Winter, even years.**
Quantitative and qualitative study of the actual and potential uses of microorganisms in industry and human affairs.
- 623. Advanced Medical Microbiology (5). Lec. 2, Lab. 6. Pr., BY 302 and 542 or equivalent.**
Experimental and theoretical aspects of mechanisms of pathogenicity/virulence infectivity, pathologic manifestations, and biochemical activities of microorganisms of medical importance.
- 625. Special Problems. Credit to be arranged.**
A. Cytology; B. Ecology; C. Morphology; D. Mycology; E. Nematology; F. Pathology; G. Physiology; H. Taxonomy; I. Chemical Weed Control; J. Marine Botany; K. General Biology Teaching & Permission of Instructor; L. Virology; M. Microbial Ecology; N. Experimental Microbiology; O. Clinical Microbiology; P. Medical Virology; Q. Serology; R. Microbial Physiology; S. Microbial Taxonomy; T. Biological Statistics; and U. Statistical Genetics; V. Mycotoxicology; W. Microbiology Teaching and permission of instructor.
- 626. Advanced Mycology I (5). Lec. 2, Lab. 6. Pr., BY 505 and consent of instructor. Spring, even years.**
Classification of fungi and lichens. Detailed studies of selected families of Ascomycetes and Fungi Imperfecti. Interpretation of comparative morphological criteria and ontogenic patterns as a guide to phylogeny. Intensive floristic investigations of particular habitats.
- 627. Advanced Mycology II (5). Lec. 2, Lab. 6. Pr., 505 and consent of instructor. Spring, odd years.**
Classification of fungi. A detailed survey of the Myxomycetes, Phycomycetes, and Basidiomycetes. Special emphasis will be placed on ecological aspects of fungi in freshwater and forest habitats. Fungal genetics will be studied.
- 640. Department Forum (1). Required of all majors, open to all minors. May be taken more than one quarter. Fall, Winter, Spring.**
Discussions concerning current topics in the various sciences and related fields.
- 650. Nuclear Science in Agriculture (5). Lec. 3, Lab. 4. Pr., graduate standing with research experience. Summer, even years.**
Role of nuclear science in agricultural research with training in the use of radioisotopes and familiarization with the possibilities, limitations, and necessary safety precautions.
- 699. Research and Thesis. Credit to be arranged. May be taken more than one quarter.**
- 799. Doctoral Research and Dissertation. Credit to be arranged.**

Building Science (BSC)

Professor Brandt, Head

Associate Professors Darden, Shuttleworth, and Timberlake

Assistant Professors Fretwell, Lechner, Liska, Schuette, and Taylor

Instructor McClinton

- 101. Introduction to Building (3). Lab. 9.**
Survey of the building industry; building procedures; study of plans and details; use of drawing tools; elements of estimating. Lectures, readings, drawings.
- 102. Drawing and Projections (3). Lab. 9. Pr., BSC 101.**
Application of geometry to orthographic, isometric, cavalier, cabinet, and perspective projections. Exercises in working drawings.
- 206. Materials and Construction (5). Coreq., EH 103.**
A survey of common materials and systems used in building. Lectures, readings, problems.
- 211. Mechanics of Structures (5). Pr., MH 161, PS 205.**
Principles of mechanics as applied to building construction; resolution of external forces; analysis of trusses; shear and bending moments. Lectures, problems.

261-262. History of Building I-II (3-3). Pr., sophomore standing.

An analysis of the development and use of construction methods and materials showing the effects of this development on building form ancient to contemporary times. Illustrated lectures, readings, reports.

311. Strength of Materials (5). Pr., BSC 211.

Strength of materials of structure members. Lectures, problems.

314 Reinforced Concrete (5). Pr., BSC 311.

Reinforced concrete. Lectures, research and problems.

315. Architectural Structures (5). Pr., BSC 314.

Applied design of beams and columns in wood and steel.

321. Construction Problems I (5). Pr., BSC 102, junior standing.

Detailed estimating; construction planning, practices, and equipment; manpower allocation. All of preceding pertaining to earthwork, concrete, steel, and masonry construction. Lectures, problems.

322. Construction Problems II (5). Pr., BSC 315.

Formwork design, concrete mixes, use of standardized construction components, dimensional controls. Lectures, problems.

323. Construction Problems III (3). Pr., BSC 315.

Construction equipment and building foundations. Lectures, problems.

324. Construction Problems IV (3). Coreq., BSC 321.

Dimensional Controls for buildings, building layout. Lectures, laboratories.

340. Construction Safety (3). Coreq., BSC 321.

Construction operations safety. Lectures, readings, and reports.

412. Structural Analysis (5). Pr., BSC 314 and MH 162.

Statically determinate structures including beams, columns, trusses, struts, and tension members. Statically indeterminate structures. Problems worked in wood, steel and other structural materials. Lectures, research and problems.

413. Structural Design (5). Pr. BSC 412.

Applied principles of material presented in 412. Lectures, problems.

414-415-416. Advanced Structures I-II-III (5-5-5). Pr., BSC 412.

Theory and practical design of complex and long span structures, both in steel and reinforced concrete. Multiple story buildings, towers, arches, vaults, domes, thin shell systems, foundations. Lectures, research and problems.

433. Construction Methods and Estimating I (5). Pr., BSC 321, senior standing.

The complete quantity survey and pricing; the builder's organization, office procedures and records; construction bonds, insurance, contracts, and financing. Preparation of bid from working drawings. Lectures, problems.

434. Construction Methods and Estimating II (5). Pr., BSC 321, senior standing.

Construction practices in relation to management control techniques for planning, scheduling, cost control and forecasting, manpower leveling and allocation. Critical path method, scheduling and applications of precedence diagrams. Lectures, problems.

452-453. Building Equipment I-II (3-3). Pr., PS 206.

Description and analysis of heating, air conditioning, water supply, plumbing, electrical wiring; motors, elevators, and illumination as related to buildings. Lectures, demonstrations, readings, problems.

454. Building Equipment III (2). Lab. 6. Pr., BSC 453.

A continuation of Building Equipment I and II in selected laboratory problems.

460. Special Problems (Credit 1-5). Pr., department head approval, junior standing.

Development of an area of concentration through independent study under staff supervision.

480. Terminal Project Research (2). Pr., senior standing.

Selection and research of the terminal project to be executed in BSC 490.

490. Terminal Project (8). Lecture 2, Lab. 15. Pr., final quarter prior to graduation.

Special study or detailed Cost Analysis and Construction Program for a building (each as approved by the Faculty Committee). Cost Analysis and Bid to include all documents required by the Contract and/or necessary to construct the project. Candidate will defend project orally before staff and guest specialists.

Chemical Engineering (CHE)

Professor Chambers, *Head*, Hsu

Associate Professors Guin, Hirth, and Vives

Assistant Professors Lee, Lui, Nishida, and Tarrer

101. Chemical Engineering Fundamentals (1).

A workshop and orientation in chemical engineering practice.

213. Digital Computers (2). Lec. 1, Lab. 3.

Workshop on digital computer programming in the area of chemical engineering.

- 310. Process Economics (3). Pr., junior standing.**
The economic factors affecting the design, operations, and economic aspects of industrial-chemical processing, including cost estimation and feasibility studies.
- 313. Chemical Engineering Analysis (4). Pr., MH 265.**
Application of mathematical principles and techniques to the analysis and solution of typical chemical engineering problems.
- 320. Analog Computation (3). Pr., MH 265, PS 222.**
The basic principles of analog computer theory and programming applications to chemical engineering. Includes time and amplitude scaling.
- 321. Chemical Process Principles (4). Pr., CH 113, PS 220, Coreq., CHE 331.**
Application of mass balance and stoichiometry to chemical processes and plants.
- 331. Engineering Thermodynamics (3). Pr., MH 264, PS 220.**
Application of thermodynamic laws and principles to engineering.
- 332. Chemical Engineering Thermodynamics I (4). Pr., CHE 331.**
Combined material and energy balances. Applications of second law. Flow processes, energy cycles.
- 343. Stagewise Processes (4). Coreq., CHE 353.**
Theory and design methods of stagewise processes such as extraction, leaching and distillation.
- 352. Fluid Mechanics (4). Pr., CHE 331 or ME 301.**
Includes conservation equations, momentum transfer in laminar flow, turbulence, dimensional analysis, design calculations for conduits, packed beds, fluidized systems and filtration.
- 353. Thermal Transfer (4). Pr., CHE 352.**
Includes heat conduction, heat transfer in laminar flow, turbulent heat transfer, analogy between heat and momentum transfer, boiling and condensing vapor, design calculations on heat transfer equipment and evaporation.
- 450. Special Topics in Chemical Engineering (Credit to be arranged with a maximum of 10 hours).**
Directed reading covering items of chemical engineering theory in depth coupled with individual laboratory work. May be taken more than once.
- 470. Seminar (1). Senior standing.**
May be taken for credit twice.

ADVANCED UNDERGRADUATE AND GRADUATE

- 511. Process Dynamics and Control (5). Lec. 3, Lab. 6. Pr., CHE 313, senior standing.**
Dynamic analysis of chemical processes. Principles of closed loop feedback control theory, stability, root locus, and frequency response. Use of analog computer for process simulation and mathematical modeling.
- 521. Chemical Engineering Thermodynamics II (4). Pr., CHE 332.**
Thermodynamics of phase and chemical equilibrium. Introduction to the statistical thermodynamics of perfect gases.
- 522. Chemical Reaction Engineering (4). Pr., CHE 521.**
Rates of reactions of various orders and complex reactions in respect to the design of chemical reactors. Considered also are catalytic reaction mechanisms and transfer of mass and heat affecting reactor design and operations.
- 540. Nuclear Engineering (5). Pr., PS 305 or PS 320, MH 265 or consent of instructor.**
Atomic physics and nuclear reactions. Nuclear reactor principles, design, and engineering, including radiation, shielding, instrumentation, and heat transfer.
- 542. Chemical Engineering Design I (4). Coreq., CHE 522.**
Individual or group design projects relating to chemical engineering practice.
- 543. Chemical Engineering Design II (6). Pr., CHE 542, senior standing.**
- 551. Mass Transfer (4). Pr., CHE 353.**
Laminar and turbulent mass transfer, gas absorption, humidification and distillation.
- 560. Introduction to Plastics (3). Pr., CH 304 or consent of instructor.**
High polymers. Includes the chemistry, technology and uses of cellulose, phenolics and amino plastics, polyolefins, vinyls, styrene, acrylics, polyesters, epoxies, polyamides, polyurethanes, silicones and rubbers.
- 565. Industrial Waste Water Treatment (4). Lec. 3, Lab. 3. Pr., CHE 352, ME 340, or CE 308.**
Introduction to chemical treatment methods for industrial waste water pollutants. Identification and analysis of major industrial water pollutants. Design and cost considerations in chemical process treatment equipment.
- 575. Rate Processes in Materials (3). Pr., CH 408 or consent of instructor.**
Diffusion in the gas, liquid and solid phases and the fundamentals of chemical reaction kinetics pertinent to the crystallization and transformation of materials.
- 582. Chemical Engineering Laboratory (6). Lec. 3, Lab. 9. Pr., CHE 551.**
Laboratory work in chemical engineering processes.

585. Air Quality Engineering (4). Lec. 3, Lab. 3. Pr., CHE 331 or ME 301.

Sources and chemical nature of gaseous pollutants. Principles of mass transfer as related to the removal of gas pollutants. Design calculations and engineering of treatment facilities including adsorption and absorption.

595. Biochemical Engineering (3). Pr., CH 518, BY 300.

Kinetics and reactor design for fermentation processes. Principles of industrial sterilization.

GRADUATE**600. Chemical Engineering Analysis I (3). Pr., graduate standing.**

Mathematical analysis of chemical engineering problems to include the formulation of differential equations, analytical and numerical techniques for problem solution, data correlation and analysis, and computer applications.

601. Chemical Engineering Analysis II (3). Pr., CHE 600.

A continuation of CHE 600.

610. Transport Phenomena I (3). Coreq., CHE 600.

Principles of momentum, heat and mass transport, laminar systems, equations of motion.

611. Transport Phenomena II (3). Pr., CHE 610.

A continuation of CHE 610.

612. Transport Phenomena III (3). Pr., CHE 611.

A continuation of CHE 611 with special emphasis on turbulence.

613. Transport Phenomena IV (3). Pr., CHE 612.

A continuation of CHE 612.

620. Chemical Engineering Thermodynamics I (3). Pr., graduate standing.

Properties of real gases and liquids, chemicals and phase equilibrium.

621. Chemical Engineering Thermodynamics II (3). Pr., CHE 620.

Phase equilibrium of non-electrolytes.

622. Engineering Statistical Thermodynamics I (3). Pr., CHE 620.

Fundamentals of statistical mechanics, partition functions, chemical equilibrium.

623. Engineering Statistical Thermodynamics II (3). Pr., CHE 622.

Applications of molecular theory and models to the properties of real gases and liquids.

625. Reaction Engineering I (3). Pr., CHE 610.

Analysis and design of chemical reactors.

626. Reaction Engineering II (3). Pr., CHE 625.

A continuation of CHE 625.

630. Process Dynamics and Control I (3). Coreq., CHE 600.

Advanced linear control system analysis and an introduction to nonlinear systems.

631. Process Dynamics and Control II (3). Pr., CHE 630.

An introduction to modern control theory with emphasis on chemical reactors and stagewise processes.

632. Process Modeling and Simulation (3). Pr., CHE 600.

Mathematical modeling of chemical process systems, process simulation with analog computers and digital simulation languages.

633. Optimization (3). Pr., CHE 632.

Applications of linear and non-linear optimization techniques to chemical process and equipment design, introduction to optimal control.

640. Distillation (3). Pr., consent of instructor, graduate standing.

Design principles for multicomponent, extractive, azeotropic, and other complex distillation processes.

641. Absorption and Extraction (3). Pr., consent of instructor, graduate standing.

Design principles for gas absorption and extraction processes.

642. Heat Transfer (3). Pr., consent of instructor, graduate standing.

Analysis and design principles for advanced heat transfer processes, special emphasis on two phase heat transfer in reaction systems, packed beds, and other process equipment.

645. Polymer Engineering (3). Pr., consent of instructor, graduate standing.

Structure of polymers, molecular forces and properties, polymer formation and modification, kinetics of polymerization, polymer technology and applications.

646. Process Economics (3). Pr., consent of instructor, graduate standing.

Venture analysis, project justification, cost estimation, and project engineering.

647. Chemical-Physical Treatment of Waste Water (3). Pr., CHE 522, 551.

Principles of chemical oxidation, adsorption, flocculation and coagulation, and ion exchange as applied to the treatment of waste water.

650. **Special Topics in Chemical Engineering (Credit TBA). Pr., consent of instructor, departmental approval.**
May be taken more than one quarter.
670. **Seminar (1). Pr., graduate standing.**
May be taken up to three quarters for credit.
699. **Research and Thesis. Credit to be arranged.**

Chemistry (CH)

Professors Colburn, *Head*, Baker, Melius, Quagliano,
Stevens, Vallarino, and Ward
Adjunct Professor McAuliffe

Associate Professors Dinius, Greene, Johnson, Neely, Peterson, Shevlin, Wheatley, and Ziegler

Assistant Professors Aull, Breen, Friedman, Hargis, Hill, Jordan, Kohl,
Mountcastle, Perry, Webb, and Worley

101. **Introductory Chemistry I (2). Lec. 4. Pr. or Coreq., MH 140, MH 160, or MH 161.**
To acquaint science students with the classifications of matter and the manner in which the chemist identifies matter and records the nature of its changes. Atomic structure, chemical bonding, molecular aggregations and the laws summarizing the properties and nature of the physical states of matter are considered.
102. **Introductory Chemistry II (2). Lec. 3. Pr., CH 101, Coreq., CH 103L.**
A continuation of the topics described under CH 101.
103. **Fundamentals of Chemistry I (4). Lec. 4. Pr., high school chemistry, Coreq., MH 160 or 161; CH 103L.**
Encompasses the subject matter of CH 101 and 102 for the superior student with adequate background preparation. Assignment of this course is based upon certain placement criteria and departmental approval is required.
- 103L. **General Chemistry Laboratory (1). Lab. 3. Coreq., CH 102 or 103.**
The basic laboratory techniques, to experimental measurements, and to the interpretation of data.
104. **Fundamentals of Chemistry II (4). Lec. 4. Pr., CH 103 or 102, Coreq., CH 104L.**
A continuation of CH 102 or CH 103. The methods of preparation and the reactions of individual as well as classes of chemical compounds are used to study and illustrate the mechanism and dynamics of chemical change.
- 104L. **General Chemistry Laboratory (1). Lab. 3. Pr., CH 103L, Coreq., CH 104.**
A continuation of CH 103L.
105. **Fundamentals of Chemistry III (4). Lec. 4. Pr., CH 104, Coreq., CH 105L.**
Solution chemistry including various ionic equilibria, coordination compounds, acid-base phenomena and redox processes. Quantitative analytical problem-solving will be emphasized.
- 105L. **General Chemistry Laboratory (1). Lab. 3. Coreq., CH 105.**
A continuation of CH 103L and CH 104L.
111. **General Chemistry (5). Lec. 4, Lab. 3. Coreq., MH 160, or 140, or 161. Credit in CH 101, 102 or 103 precludes credit for this course.**
For chemistry majors and others in closely related areas.
112. **General Chemistry (5). Lec. 4, Lab. 3. Pr., CH 111 or 103. Credit in CH 104 precludes credit for this course.**
Continuation of CH 111.
113. **General Chemistry (5). Lec. 4, Lab. 3. Pr., CH 112. Credit in CH 105 precludes credit for this course.**
Continuation of CH 112.
201. **Descriptive Chemical Science (5). Lec. 5. Pr., MH 140.**
To foster in the non-science student an appreciation for the chemical nature of the material universe and the contribution of chemistry to his cultural heritage. This course will not serve as a prerequisite for any other chemistry course.
203. **Organic Chemistry (5). Pr., CH 104.**
Fundamentals of organic chemistry. Designed for students in Home Economics, and others.
204. **Analytical Chemistry (3). Lec. 3. Each quarter. Pr., CH 105 and 105L or 113.**
Theory and application of gravimetric, volumetric, and colorimetric chemical analysis.
- 204L. **Analytical Chemistry Laboratory (2). Lab. 8. Each quarter. Pr. or Coreq., CH 204.**
Analytical techniques applied to the analysis of ores and minerals.

- 205. Analytical Chemistry (5). Lec. 3, Lab. 6. Pr., CH 204.**
Fundamental concepts used in analytical chemistry and observed in the laboratory via gravimetric analysis and separation techniques.
- 207. Organic Chemistry (4). Lec. 4. Pr., CH 104.**
This course together with CH 208 meets the needs of students in Laboratory Technology, Pre-Medicine, Pre-Dentistry, Pre-Veterinary Medicine, Pre-Pharmacy, and in other biological sciences.
- 207L. Organic Chemistry Laboratory (1). Lab. 3. Pr. or Coreq., CH 207.**
- 208. Organic Chemistry (3). Lec. 3. Pr., CH 207 and 207L.**
Continuation of CH 207
- 208L. Organic Chemistry Laboratory (2). Lab. 6. Pr. or Coreq., CH 208.**
- 209. Organic Chemistry (5). Lec. 5. Pr., CH 208.**
A continuation of CH 208 with emphasis on the study of those organic compounds considered to be the most important to the understanding of biochemistry, i.e., polyfunctional compounds, carbohydrates, liquids, amino acids, proteins, and heterocyclic compounds.
- 301. Biochemistry (5). Pr., CH 208. Credit in CH 518 precludes credit for this course.**
Especially designed for students in Pharmacy.
- 302. Biochemistry (5). Pr., CH 301. Credit in CH 519 precludes credit for this course.**
Continuation of CH 301
- 303. Organic Chemistry (5). Lec. 4, Lab. 3. Pr., CH 113.**
Organic chemistry covering nomenclature, group reactions, important theories and concepts relating to aliphatic and aromatic compounds, designed primarily for chemistry majors.
- 304. Organic Chemistry (5). Lec. 3, Lab. 6. Pr., CH 303.**
Continuation and extension of CH 303.
- 305. Organic Chemistry (5). Lec. 3, Lab. 6. Pr., CH 304.**
Continuation and extension of CH 303-304, including heterocyclic compounds and many classes of compounds of interest in the field of biochemistry.
- 316. Physical Chemistry (5). Pr., MH 140 or MH 160, CH 105 and PS 205.**
A one-quarter course for pre-medicine students.
- 490. Special Problems in Chemistry (5). Lab 15. Pr., consent of instructor, senior standing. Not open to graduate students. May be repeated for a maximum of 15 credit hours.**
An individual problem course. Each student will work under the direction of a staff member on some problem of mutual interest.

ADVANCED UNDERGRADUATE AND GRADUATE

- 504. Organic Analysis (Qualitative) (5). Lec. 3, Lab. 6. Pr., CH 305 or equivalent.**
After performing identification tests on known compounds, the student identifies pure organic unknowns, and separates and identifies the compounds of mixtures. Graduate students identify more unknowns than required of undergraduates.
- 507. Physical Chemistry (5). Lec. 4, Lab. 3. Pr., CH 104 or 112; MH 264; PS 221 or 206.**
A discussion of the more important theories and laws of physical chemistry.
- 508. Physical Chemistry (5). Lec. 4, Lab. 3. Pr., CH 507.**
Continuation of CH 507.
- 509. Physical Chemistry (5). Lec. 4, Lab. 3. Pr., CH 508.**
An extension of principles studied in CH 507-8 with special reference to modern theories of the structure of matter.
- 510. Intermediate Inorganic Chemistry I (5). Lec. 5. Pr., CH 508.**
Atomic structures, valence bonding, and periodic properties of the elements.
- 511. Intermediate Inorganic Chemistry (5). Lec. 3, Lab. 6. Pr., CH 510.**
Synthesis and purification of typical inorganic compounds.
- 512. Chemical Thermodynamics (5). Pr., CH 508.**
Basic laws governing changes in energy in gases, liquids, and solids.
- 513. Analytical Chemistry (5). Lec. 3, Lab. 6. Pr., CH 509.**
Fundamental concepts used in instrumental analytical chemistry and as observed in the laboratory via spectrophotometric, electroanalytical, and chromatographic techniques.
- 515. Polymer Technology I (4). Lec. 3, Lab. 3. Pr., CH 304 or CHE 560.**
Important aspects of polymer science, connection between chemical structure and important properties of modern plastics and synthetic structural materials, the common methods of fabrication of these into articles and the basic chemistry behind their manufacture.
- 516. Polymer Technology II (3). Lec. 3. Pr., CH 515 or TE 424.**
Continuation of CH 515. Study of polymerization and condensation polymers. Modes of fabrication, special use selection requirements, and study of a number of commercially available materials and their areas of use.

- 518. Biochemistry (5). Lec. 4, Lab. 3. Pr., CH 204, 204L, 208.**
Classification, structure and chemistry of the major chemical constituents of living matter. (Same course as ADS 518.)
- 519. Biochemistry (5). Lec. 4, Lab. 3. Pr., CH 518 or its equivalent.**
Introduction to metabolism. (Same course as ADS 519.)
- 520. Clinical Biochemistry (5). Lec. 3, Lab. 6. Pr., CH 519 or its equivalent.**
Principles of clinical chemical analysis.

GRADUATE

- 610. Advanced Inorganic Chemistry (5). Pr., CH 510 or equivalent.**
Selected groups of inorganic compounds are considered from a modern physicochemical viewpoint; thus emphasizing their chemical and physical properties, their rates of conversion one into another, their molecular structure, and valence relationships.
- 611. Physical Methods in Inorganic Chemistry (5). Pr., CH 610 or equivalent.**
The theory and applications of modern techniques for structural and bonding information in inorganic chemistry. NMRM, IR, Ramon, NQR, mass spectroscopy, electronic spectra, ESR, and other techniques will be discussed.
- 612. Organo-Metallic Chemistry (5). Pr., CH 610 or equivalent.**
General organo-metallic chemistry with an emphasis on recent developments.
- 614. The Chemistry of Coordination Compounds (5). Pr., CH 510 or equivalent.**
Complex inorganic compounds with emphasis on early and modern developments, isomerism, chelation, and methods of determining formation constants.
- 616. Advanced Topics in Inorganic Chemistry (5). Pr., CH 610 or equivalent.**
Includes the most active research areas of modern inorganic chemistry.
- 620. Advanced Organic Chemistry I (5). Lec. 5. Pr., CH 305 or equivalent.**
Organic reaction mechanisms, free radicals, carbonium ions, carbanions, carbenes, etc.
- 621. Advanced Organic Chemistry II (5). Lec. 5. Pr., CH 620.**
Physical organic chemistry with emphasis on the interpretation of organic reaction mechanisms.
- 622. Advanced Organic Chemistry III (5). Lec. 5. Pr., CH 620.**
Current synthetic methods of organic chemistry.
- 623. Heterocyclic Compounds (5). Pr., CH 621 or equivalent.**
Organic compounds containing heterocyclic ring systems.
- 624. Element-Organic Compounds (5). Pr., CH 621 or equivalent.**
Organic chemistry of Groups III, IV and V elements.
- 625. Organic Nitrogen Compounds (5). Pr., CH 621 or equivalent.**
Organic compounds containing nitrogen.
- 627. Special Topics in Organic Chemistry (5). Pr., CH 621 or equivalent.**
A selection of modern topics in organic chemistry.
- 628. Introduction to Theoretical Organic Chemistry (5). Pr., CH 621 or equivalent.**
Topics generally considered include molecular structure, chemical reactions and energy change, structure-reactivity relationships, dipole moments and carbonium, olefinic and free-radical stability, and organic chemical spectroscopy.
- 630-631. Advanced Physical Chemistry (5-5). Pr., CH 509. CH 630 is pr. for CH 631.**
Topics generally considered include kinetic theory of matter, modern theories of the structure of matter, generalized thermodynamics, relation of molecular structure to spectroscopic and thermodynamic properties, and kinetics of chemical reactions.
- 632. Relation Between Structure and Properties of Chemical Substances (5). Pr., CH 631.**
Established relationships that exist between structures of organic and inorganic compounds and physical properties which are relatively easy to determine. The principal aim is the demonstration of the fundamental relation of structure compounds and electronic configurations.
- 633. Chemical Kinetics (5). Pr., CH 631.**
The mathematics and characterization of chemically reacting systems includes discussions of the collision theory, the transition state theory, unimolecular reactions in condensed phases, behavior of nonstationary-state systems, and photochemistry.
- 634. Heterogeneous Equilibria (5). Pr., CH 631.**
Chemical and physical equilibria in heterogeneous systems.
- 636. Statistical Thermodynamics (5). Pr., CH 631.**
Statistical approach to thermodynamics and chemical equilibrium.
- 637. Introduction to Quantum Chemistry (5). Pr., CH 631.**
Quantum theory as applied to chemical problems.
- 638. Molecular Spectroscopy (5). Pr., CH 631.**
Theory and application of optical and magnetic resonance spectroscopy.

- 640. Carbohydrates (5). Pr., CH 518 or equivalent.**
The chemistry of the mono- and polysaccharides.
- 641. Proteins (5). Pr., CH 507 and CH 519 or equivalent.**
Chemical and physical properties of amino acids and proteins, protein structure and the relation of protein structure to function.
- 642. Lipids (5). Pr., CH 519 or equivalent.**
Chemistry of the lipids and their biological significance.
- 643. Enzymes (5). Pr., CH 519 or equivalent.**
The principles of enzyme chemistry including the physical, chemical and catalytic properties of enzymes.
- 644. Topics in Biochemistry (1-10). Pr., CH 519 or equivalent and approval of instructor.**
Advanced study in selected areas of metabolism and the techniques for characterization of macromolecules.
- 645. Biochemical Research Techniques (5). Pr., CH 519 or equivalent.**
Modern biochemical laboratory techniques.
- 646. Physical Biochemistry (5). Pr., CH 305 and CH 509 or equivalent.**
The structure and properties of biological compounds (saccharides, lipids, amino acids, proteins, nucleic acids, and enzymes) are studied. The bioenergetics of the important metabolic pathways are also investigated. Emphasis will be on structure of biological compounds and mechanisms of biological reactions.
- 650. Analytical Chemistry (5). Pr., CH 513 or equivalent.**
Analytical principles, applications and methods, mathematical interpretations, and current developments.
- 651. Analytical Chemistry (5). Lec. 4, Lab. 3. Pr., CH 513.**
Analytical application of chemical spectroscopy.
- 652. Theories and Current Topics of Analytical Chemistry (5). Pr., CH 651. Winter, odd years.**
- 653. Physio-chemical Separations (5). Lec. 4, Lab. 3. Pr., CH 509. Spring, even years.**
- 654. Radiochemical Analysis (5). Lec. 3, Lab. 6. Pr., CH 205. Summer, odd years.**
The application of radioactive tracers and related techniques to chemical analysis.
- 655. Chemical Instrumentation (5). Lec. 5.**
Chemical transducers and conversion of the transducer output to some usable form.
- 670. Seminar (1). May be repeated for a maximum of 10 credit hours. Each quarter except Summer.**
Required course for all graduate students in chemistry.
- 691. Directed Individual Study in Contemporary Chemistry. (Credit to be arranged.) Pr., completion of 30 hours of graduate courses in chemistry. May be repeated for credit.**

Civil Engineering (CE)

Professors Rainer, Head, Hudson, and Krishnamurthy

Associate Professors Gibson, Judkins, and Warman

Assistant Professors Bell, Jenkins, Kurt, Molz, Moore, Morgan, Ramey, and Vecellio

Instructors Hudgins, Moon, and Reed

- 201. Surveying (5). Lec. 4, Lab. 3. Pr., CE 202 or concurrently.**
Data collection and analysis emphasized. Analysis of errors; simple curves, vertical curves, spirals; topographic mapping and land surveying.
- 202. Introduction to Computer Methods in Civil Engineering (3). Lec. 2, Lab. 3. Pr., MH 265 or concurrently.**
Introduction to electronic digital computer programming; machine solution of civil engineering problems; library programs.
- 205. Engineering Mechanics—Statics (4). Pr., PS 220 or concurrently. Coreq., MH 264.**
Basic principles of statics. Free body concepts. Parallel, concurrent, and nonconcurrent force systems; coplanar and noncoplanar. Friction. Centroids, and moments of inertia. Thrust, shear and moment at sections.
- 207. Mechanics of Solids (3). Pr., CE 205 or ME 205, and MH 264. Coreq., MH 265.**
Principles of strength of materials: Equilibrium, compatibility, and properties of materials. Mechanics of deformable bodies. Stress and strain, strain gages and rosettes, principal stresses and strains. Stress-strain-temperature relations. Simple application to stress and deformation analysis of axial force, torsion and flexure problems. Fundamentals of continuum mechanics.
- 301. Civil Engineering Analysis (5). Pr., CE 202, MH 265.**
Applications of mathematics to analysis of physical systems encountered in civil engineering.

- 304. Theory of Structures I (5). Lec. 4, Lab. 3. Pr., CE 207 and MH 265.**
Objectives of structural design, structural form, introduction to structural analysis. Stability and determinacy of structures. Analysis of statically determinate trusses, beams, frames, arches and cables. Shear, moment and thrust diagrams. Influence lines. Moving loads. Deflections by double integration of moment area. Stress analyses. Introduction to column buckling. Laboratory assignments in strain measurements, determination of stress-strain relations, stress distribution analysis, and examination of behavior of structural components.
- 305. Water Supply and Disposal Systems (5). Pr., CE 308.**
Theory and design of water collection and distribution facilities and waste water collection systems.
- 308. Hydraulics (5). Lec. 4, Lab. 3. Pr., CHE 352 or equivalent.**
Ideal fluid flow, real fluids, fluid resistance; fluid measurement and control; steady pipe flow, steady open channel flow, unsteady flow. Emphasis on steady flow and open channel flow.
- 315. Engineering Geology (4). Pr., junior standing.**
Rock classification and engineering properties. Stratigraphic sequence, folds, faults, joints, and engineering significance of these features. Formation and transport of soils. Geophysical exploration techniques.
- 320. Fundamentals of Transportation Engineering (5). Pr., EC 200, CE 201.**
An introduction to the planning, design and operations of transportation systems: streets and highways, railroads, airports, waterways and pipelines, and mass transportation facilities.
- 380. Theory of Structures II (5). Pr., CE 304.**
Strain energy principles and their application to the determination of deflections of trusses, and rotations and displacements of beams and frames, under axial force, bending, shear and torsion. Reciprocal theorem. Analysis of indeterminate structures by method of consistent deformation, moment distribution, and slope deflection. Matrix formulations of force and displacement methods of structural analysis.
- 400. Advanced Surveying and Mapping (5). Lec. 4, Lab. 3. Pr., junior standing.**
Photogrammetric principles and mensuration are emphasized. Selected topics from map projections, electronic and special instruments: geodesy.
- 404. Structural Analysis (4). Pr., CE 380, senior standing.**
Working stress and ultimate strength theories. Principles of stress analysis and design of structural members in steel, reinforced concrete, and other structural materials. Structural loads. Design criteria and procedures for axial force, bending and shear. Buckling of columns.
- 405. Water and Waste Water Treatment (5). Lec. 4, Lab. 3. Pr., CE 305, junior standing.**
Theory, design, construction, and operation of water treatment and waste water disposal facilities considered on a unit operations basis. Laboratory includes fundamental tests relating to both water supply and waste water treatment. Emphasis placed on theory and significance of the tests.
- 406. Introduction to Soil Mechanics (5). Lec. 4, Lab. 3. Pr., CE 301, 315.**
Physical properties of soils; subsurface investigations; clay mineralogy; soil classification; concept of effective stress; elementary seepage theory; flow nets; consolidation theory; time-settlement analyses; and soil compaction.
- 407. Urban Engineering I (3). Pr., senior standing.**
Duties and responsibilities of city engineer and urban consultant; problems connected with promoting, financing, designing, and constructing urban improvements.
- 408. Environmental Engineering Design (5). Pr., CE 405.**
The theory and design techniques discussed in CE 305 and CE 405 will be applied to the design of environmental engineering systems. The economics of alternative designs will be considered.
- 414. Structural Steel Design (5). Pr., CE 404.**
Design and analysis of steel members in tension, compression, shear and flexure, and for combined effects. Elastic and plastic theories. Design of trusses, frameworks, and connections.
- 415. Construction Planning (5). Pr., CE 301, junior standing.**
The construction process as a system, organization of construction engineering functions; financial analysis; cost concepts and elements in pricing; selection and evaluation of construction methods: CPM and PERT.
- 416. Reinforced Concrete Design (5). Pr., CE 404.**
Concrete properties. Design synthesis and analysis of reinforced concrete beams, slabs, columns and footings.
- 417. Soil and Foundation Engineering (3). Pr., CE 304, 406, junior standing.**
Slope stability; vertical and lateral soil pressures; bearing capacity; foundations: lateral bracing; dewatering.
- 419. Urban Engineering II (3). Pr., senior standing.**
Engineering problems of urban transportation, communications, water supply, sewerage, streets, schools, shopping, parking, and recreation facilities.
- 423. Similitude in Engineering (3). Lec. 2, Lab. 3. Pr., consent of instructor or senior standing.**
Principles of dimensional analysis and similitude. Aspects of engineering experimentation. Types and uses of models, analogies. Simple applications to engineering problems.
- 425. Soil Stabilization (3). Pr., CE 406, or equivalent.**
Methods of stabilizing soft soil; consolidation, compaction with the use of lime, cement and other additives; construction operations, costs, and field control related to soil stabilization.

428. Radiological Health Engineering (3). Pr., senior standing.

Sources and properties of radiation, ionizing effects, biological effects, dosimetry, detection and measurement, design of radiation shielding, decontamination, disposal of wastes, legal aspects of radiation control, public attitudes.

430. Foundation Design and Construction (5). Pr., CE 417 (or concurrently).

Review of reinforced concrete fundamentals; spread footings; combined footings; mat foundations; piles and pile driving; caissons; cofferdams; dewatering; retaining walls; bulkheads.

433. Airport Design (5). Pr., CE 320, consent of instructor, junior standing.

An analysis of the elements affecting the design of commercial and general aviation airports including runway configuration, capacity analyses, and geometric design of runways, taxiways and terminal facilities.

490. Special Problems. (credit 1-5). Pr., consent of instructor and department head approval.

Individual student endeavor under staff supervision involving special problems of an advanced nature in civil engineering.

ADVANCED UNDERGRADUATE AND GRADUATE**509. Environmental Health Engineering (3). Pr., senior standing.**

Application of engineering methodology to communicable disease control, insect and rodent control, milk and food sanitation, industrial hygiene and refuse collection and disposal.

510. Transportation Engineering (5). Pr., CE 320 and IE 410, or equivalent.

Fundamental elements of traffic engineering including traffic and transportation studies, traffic flow theory, intersection design, and traffic surveillance and control systems.

511. Flow in Open Channels (5). Pr., CE 308.

Uniform flow, rapidly varied flow, gradually varied flow, subcritical transitions, surges, supercritical transitions, bends, precipitous slopes, energy dissipation, spillways, and oscillatory waves.

512. Hydrology (5).

Precipitation, runoff, flood routing, flood control, river regulation, and coastal engineering problems.

518. Prestressed Concrete (3). Pr., CE 404.

Prestressing systems. Analysis and design of pre-tensioned and post-tensioned beams for flexure and diagonal tension.

520. Sanitary Engineering Laboratory (5). Lec. 4, Lab. 3. Coreq., CE 405.

The physical, chemical, and biological aspects of environmental engineering; laboratory testing procedures and experiments relating to the treatment of waters and wastes; interpretation of routine plant control analyses and indices of pollution.

521. Water Resources Engineering (5). Pr., CE 308, senior standing.

Environmental significance; hydrologic factors; water laws; water uses; nature, sources and abatement of pollution; quality control measures, planning.

522. Computer Methods in Structural Engineering (3). Pr., CE 380.

Principles of matrix formulations of structural problems; force and displacement methods. Algorithms for computer programs for analysis of trusses, beams and frames. Introduction to applications to continua. Use of computer programs, practical applications.

524. Air Pollution (3). Pr., consent of instructor, senior standing.

Studies of the nature, sources and effects of polluting materials including gases, dusts, vapors and fumes and the relations of atmospheric conditions to their dispersal. Introduction to theory and design of air pollution control devices and sampling programs. Legal aspects of air pollution will be discussed.

527. Fundamentals of Water Supply and Waste Treatment (5). Pr., consent of instructor, senior standing. (Not for credit for civil engineering students).

The principles of water supply and waste disposal and the chemistry and biology of water and waste treatment will be presented. Alternatives in water supply and waste disposal will be considered and the theory of treatment operations will be discussed. Laboratory exercises will be conducted.

532. Geometric Design (5). Pr., CE 320.

An analysis of the elements affecting the location and design of rural highways, urban highways, and arterial streets including design controls and criteria, cross-section elements, intersection design, interchange design, and social and environmental considerations.

592. Linear Optimization Methods (5). Pr., MH 265.

Simultaneous linear equations and inequalities, vector spaces, transformation of variables, algorithms of solution or optimization of a linear expression with linear constraints, introduction to error analysis, approximation by linear expressions, separable programming, introduction to game theory.

593. Discrete Optimization Methods (5). Pr., CE 592.

Optimization with discrete-valued variables or combination of discrete and continuous variables. Both deterministic and probabilistic situations to be handled by sequential optimization or networks in graph theory. Adaptations of discrete and continuous variable methods, such as finite differences or integer linear programming.

GRADUATE

- 602. Advanced Soil Mechanics (5). Lec. 4, Lab. 3. Pr., CE 417 or equivalent.**
Stress-strain characteristics of soils, stress distribution in soil media, consolidation, shear strength, and bearing capacity, with application to analysis and design of spread footings, rafts, and deep foundations; case studies.
- 603. Quantitative Methods for the Planning Process (5).**
Statistical and mathematical tools useful in modern planning analysis. Surveys of various techniques to facilitate decisions in the planning process. Emphasis on the role and evaluation of modern quantitative techniques rather than technical competency.
- 604. Seepage Through Porous Media (5). Pr., CE 602 or consent of instructor.**
Darcy's Law, soil permeability coefficients, unconfined and confined flow in porous media, methods of solutions; analog methods; numerical and graphical techniques; soil filters, drainage, dewatering, well flow.
- 605. Soil Stability Problems (5). Pr., CE 604 or consent of instructor.**
Retaining structures including cofferdams, bulkheads, and retaining walls; stability of natural and cut slopes, embankments; earth dam design; methods of field measurements; case studies.
- 606. Soil Dynamics (5). Pr., CE 602, consent of instructor.**
Wave propagations in soils, lumped systems as applied to soil-structure systems, soil properties for dynamic loading conditions; earthquakes, oscillations, and blast loading conditions; analysis and design.
- 609. Pavement Design (5). Pr., CE 425, 602 or consent of instructor.**
Utilization of soils for subgrades, bases, and pavements; composition and thickness design for parking, highway, and airport pavements; stress distribution of wheel loads in layered media, construction procedures; field control tests; cost analysis of pavements.
- 610. Model Analysis of Structures (3). Lec. 2, Lab. 3. Pr., CE 423 or consent of instructor.**
Structural models, Direct and indirect model analysis of structures. Analogies.
- 611. Transportation Planning (3). Pr., CE 603 or consent of instructor.**
The transportation planning process; trip generation, forecasting and assignment techniques; goal formulation and analysis of plans.
- 613. Numerical Methods in Hydrology (3). Pr., CE 202, 301, 308, MH 362 or consent of instructor.**
Development of the basic matter and energy transport equations for the surface and subsurface hydrologic systems, derivation and solution of numerical approximations by direct and iterative methods with applications to engineering problems.
- 620. Unit Operations in Water and Waste Treatment (4). Pr., consent of instructor.**
The theory of various unit operations is developed and the application of these operations to water and waste treatment is considered.
- 621. Unit Processes in Water and Waste Treatment (5).**
Alkalinity, acidity, corrosion, chemical precipitation, ion exchange, adsorption, coagulation, disinfection and gas transfer are discussed. Laboratory exercises relating to each topic are performed.
- 622. Biological and Advanced Waste Treatment (5). Pr., consent of instructor.**
Development and application of the theories of biological waste treatment.
- 623. Industrial Waste Treatment (5).**
Industrial waste problems, including the characteristics of individual industries, effects on streams, and methods of treatment and disposal.
- 624. Water Resource Systems I (5). Pr., CE 593.**
Applications of systems methodology to the analysis of problems involving hydrology, surface and subsurface reservoirs, flood forecasting, flood routing and reservoir design and operation.
- 625. Water Resource Systems II (5).**
Techniques such as simulation, linear and dynamic programming and queueing theory applied to pipe networks, open channels, transients in closed conduits, and water supply and waste water treatment systems.
- 626. Water Resources Systems III (5). Pr., CE 624, 625.**
Water quality forecasting and multipurpose river basin development. The current literature will be studied.
- 627. Environmental Engineering Chemical Theory (4). Lec. 3, Lab. 3. Pr., consent of instructor.**
The chemistry of natural systems including: equilibrium chemistry of dilute aqueous systems, buffer systems in natural water, thermodynamics, and surface chemistry as related to destabilization, stabilization, sorption and ion exchange properties.
- 628. Stream Sanitation (3). Pr., CE 621 or consent of instructor.**
Physical, chemical, biological and hydrological considerations relating to the degradation and self-purification of streams and estuaries. Water uses and water quality goals, objectives, and criteria. Principles of water quality modeling and waste-load allocation. The dissolved oxygen balance of aquatic environments will be emphasized. Field studies will be performed.

630. Advanced Structural Analysis (5).

Response of structures and components to complex loading combinations and support conditions. Shear center, unsymmetrical bending, curved beams. Beams on elastic foundations. Torsion of non-circular sections. Column theory and buckling. Theories of failure. Inelastic theory of structures. Yield line theory of slabs.

631. Special Topics in Structural Analysis and Design (5). Lec. 4, Lab. 3. Pr., consent of instructor.

Analysis and design of plate and shell structures. Special problems in advanced structural analysis and design.

632. Experimental Techniques in Structural Analysis (3). Lec. 2, Lab. 3.

Basic theory, techniques and instrumentation for structural testing. Mechanical and electrical strain gages. Brittle lacquer, photogrid, and photoelastic methods. Instrumentation for structural testing.

634. Advanced Theory of Structures (5).

Moment distribution of frames with multiple degrees of freedom. Minimum energy principle, conjugate structure, elastic center, and column analogy methods. Flexural members with varying moments of inertia. Arches and cables. Special topics.

635. Numerical Techniques in Structural Analysis (5).

Numerical methods of analysis for structural members of variable section: stiffness factors; stability; vibrations; elastic foundations; beam-columns.

637. Advanced Matrix Analysis of Skeletal Structures (4). Pr., CE 422 or consent of instructor.

Review of displacement and force methods of matrix analysis of structures. Advanced applications to determinate and indeterminate trusses, beams and frames. Yielding of supports, lack of fit and temperature effects. Special topics.

638. Finite Element Methods in Structural Mechanics (5). Pr., CE 637 or consent of instructor.

Principles of finite element analysis. Variational principles, displacement formulations. Plane stress, plane strain and axisymmetric analyses. Extension to three-dimensional problems. Thermal stresses. Special applications.

660. Construction Applications of Operations Research I (3). Pr., CE 592 or equivalent, and MH 560 or equivalent.

The application of operations research methods to construction engineering; linear programming; deterministic inventory models; replacement, maintenance, and reliability models. Sensitivity analysis.

661. Construction Engineering Functions (3).

Organization of construction engineering functions emphasizing underlying economic principles and phenomena associated with construction engineering projects. Financial analysis, cost concepts and elements in pricing, volume-cost-profit relationships, decision-making models, and legal environment.

662. Construction Application of Operations Research II (3). Pr., CE 660.

The application of operations research methods to construction engineering; dynamic programming; probabilistic inventory models; waiting-lines; simulation.

663. Construction Engineering Methods (3). Pr., CE 660, 661.

The application of engineering principles to the selection and evaluation of construction methods.

664. Construction Systems Planning and Control (3). Pr., CE 662, 663.

The construction process defined as an engineering system. Applicable methods of describing, analyzing, controlling, and manipulating collections of interrelated construction operations treated as a system; techniques of design of construction sub-systems and appropriate evaluation methods.

665. Construction Engineering Analysis (3). Pr., CE 662, 663.

Quantitative analysis of material handling systems with emphasis on the measurement and forecasting of productivity in construction engineering.

690. Seminar. Credit to be arranged. May be taken more than one quarter.**691. Directed Reading in Civil Engineering. Credit to be arranged. May be taken more than one quarter.****699. Research and Thesis. Credit to be arranged. May be taken more than one quarter.**

Computer Science and Engineering

Computer Science and Engineering courses are offered by cooperating academic departments; see listing in the School of Engineering, page 140.

Consumer Affairs (CA)

Professor Galbraith

Associate Professors Douty, Stowe, *Head*

Assistant Professors Barry, Clem, Hardin, Lindamood, Lorendo, Oh, Slaten, and
Trentham

Instructors Jones, Potter, and Wilson

105. **Fundamentals of Clothing (5). Lec. 2, Lab. 8. Pr., CA 115 concurrently or consent of instructor.**
Basic theories and principles of garment selection and structure, including their application in construction of apparel for personal use.
113. **Housing for Man (3).**
Housing, equipment and furnishings in terms of the total environment with reference to physical, biological, economic, cultural, and social conditions which affect the family.
115. **Clothing and Man (3).**
Cultural, aesthetic, functional, and technological factors as they interact to determine the meaning and use of clothing and textiles for the individual and society.
116. **Art for Living I (3). Lec. 3.**
A working knowledge of basic concepts in the organization and evaluation of design with emphasis placed upon the contribution of design and color as enrichment of individual and family environment.
- 116L. **Art for Living Laboratory (2). Lab. 4. Pr., CA 116 or concurrently.**
Provides the opportunity for individuals to explore color and design concepts through the manipulation of materials, tools, and processes and to obtain design evaluation experience.
205. **Clothing Consumption and Selection (3). Pr., CA 116 or equivalent.**
A survey of the clothing market, consumption problems of consumers and selection of clothing at all stages of the age-grade life cycle.
206. **Garment Structures—Theory and Application (3). Lec. 1, Lab. 5. Pr., CA 105.**
Problems involved in shaping fabric to the human form; processes and sequences in determining garment function and quality.
216. **Art for Living II (3-5). (3) Lec. 2, Lab. 2. (5) Lec. 2, Lab. 6. Pr., CA 116, 116L or equivalent.**
A continuation of the individual's artistic environment with emphasis on the application of principles of design and color to specific problems of everyday life.
225. **Textiles (5). Pr., CH 203.**
Polymers, fibers, yarns, fabrics and finishes in their relationship to apparel and household textiles.
226. **Fashion Sketching (3). Lab. 6. Pr., CA 116, 116L or equivalent.**
Provides for the fashion merchandising or clothing design major simple methods of communicating apparel designs through quick sketches to portray fashion in silhouettes, texture and color.
233. **Home Equipment I (5). Lec. 3, Lab. 4.**
Home equipment, with emphasis on selection, use and care.
303. **The House (5). Lec. 2, Lab. 6.**
Planned to give the student an appreciation of basic plans, both period and modern, from the standpoint of utility, beauty and economy.
305. **Tailoring (3). Lab. 9. Pr., CA 105 or equivalent, junior standing.**
Principles of fabric selection and tailoring applied in planning and construction of a suit or coat.
310. **Mass Communication in Family and Consumer Services (3). Lec. 1, Lab. 4. Pr., SC 202.**
Responsibilities and techniques of presenting professional information and materials to the public through radio, television and live performances.
313. **Home Furnishings (5). Pr., CA 116 or AT 112 or AT 121 or equivalent.**
Home furnishings both from an aesthetic and practical standpoint. This includes the recognition of period furniture and its adaptability to the home of today.
316. **Fashion Analysis (5). Pr., CA 205.**
Study and analysis of the dynamic nature of fashion and the interacting forces which shape fashion trends in apparel.
325. **Fashion Merchandising (5). Pr., MT 331, 433.**
Application of principles and practices of merchandising to the retailing of consumer goods and services.
333. **Lighting Design (5). Lec. 3, Lab. 4.**
Principles of lighting design applied to the solution of functional and aesthetic lighting problems in various areas of the home.

335. Retail Training (8). Pr., CA 325.

Three months practical experience with pay in large department store. Students are given formal instruction and supervision. Scheduled only by pre-arrangement.

343. Interior Home Problems (5).

Harmonious combinations of present day furnishings, materials, and finishes.

345. Creative Crafts (1-2-3). Lab. 9.

Design and execution of creative crafts: viz., metal work, leatherwork, ceramics, weaving, fabric decoration.

355. Consumer Textiles (3). Lec. 3.

Textile fabrics, finishes, and trade practices with special emphasis on consumer problems. Credit will not be allowed for both CA 225 and CA 355.

375. Creative Ceramics (1-3). Lab. 9.

Working with various clays, building processes, ceramic glazes, and ceramic design.

385. Creative Weaving (3).

Weaving design and experience in selecting yarns, setting up a loom and weaving one's own fabric.

395. Clothing Design (5). Lec. 2, Lab. 6. Pr., CA 105, 116, 116L, 226, or equivalent or consent of instructor.

Color, line, form, and texture as a basis for designing apparel, with construction, technological developments, production problems, and fashion movements which influence design decisions.

431. Man-Environment Relations (2). Pr., Home Economics core courses or consent of instructor.

The unifying principles and ideals, which are concerned with man's immediate physical environment (housing, clothing, food) and with his nature as a social being. Analysis and synthesis of principles explored in Home Economics core courses CA 113, 115, 116, NF 112, FCD 157, and FCD 323.

465. Ceramics—Advanced Construction and Glazing (2-3). Lab. 9. Pr., CA 375.

Advanced construction and glaze techniques emphasizing an individual approach, study of various glazes and glaze properties, mixing and firing of glazes formed from basic chemicals. Independent study under tutorial guidance.

466. Ceramics—Wheel Throwing (2-3). Lab. 9. Pr., CA 375.

Advanced ceramic techniques emphasizing proficiency in wheel throwing, construction, and glazing. Independent study under tutorial guidance.

473. Contemporary Home Furnishings (3). Lec. 1, Lab. 4.

Factors contributing to developments in the current home furnishings industry in design, manufacturing cost, and terminology. A project report is required.

490. Independent or Field Study (1-8).

An individual problems course involving directed readings and/or laboratory or field experiences under the direction of a faculty member on some problem of mutual interest. Field experiences may include work with families, business or industry.

ADVANCED UNDERGRADUATE AND GRADUATE**505. Costume Draping (5). Lec. 2, Lab. 9. Pr., 8 quarter hours of clothing construction.**

Creative experience in development and execution of apparel designs through draping varied fabrics on individualized body structures. Exploration and application of theories, philosophies and practices of contemporary designers.

514. Social Problems of Housing (5). Pr., CA 113 or equivalent, or consent of instructor.

Current housing policies explored as both causes of and solutions to certain social problems. Zoning and exclusionary practices, public housing, cash subsidies for housing examined.

515. History of Textiles (5). Lec. 5. Pr., CA 116 or AT 112 or AT 121.

The development of the textile industry and of fabric design from the earliest times to the present day.

516. Apparel Quality Analysis (5). Pr., basic courses in garment construction and fashion merchandising.

Analysis of quality variations of soft goods and study of factors affecting quality of materials, manufacturing processes, markets and resources.

524. Planned Change in the Fashion Industry (5). Pr., CA 325 or consent of the instructor (for non CA students).

The process involved in initiating and implementing change in the fashion industry.

525. History of Costume (5). Lec. 5. Pr., CA 116 or AT 112 or AT 121.

Outstanding historic modes in dress for men and women from early times to the present day.

533. Food Equipment (3). Lec. 1, Lab. 4. Pr., PS 200, or PS 205, CA 233.

Principles underlying the operation and use of food equipment.

535. Textile testing (5). Lec. 2, Lab. 6. Pr., CA 225 or equivalent.

Standard testing procedures and equipment used in determining the physical and chemical characteristics of fibers, yarns, and fabrics, and of the statistical methods employed in data evaluation.

- 553. The Consumer and the Market (3). Pr., MT 331 FCD 323.**
Primarily directed toward the needs of students who are preparing for careers in business, industry, and other fields intimately concerned with the consumer and the production and marketing of consumer goods. Examination of the issues and problems in the marketplace from the view-point of both the consumer and the business community.
- 555. Flat Pattern Designing (5). Lec. 2, Lab. 6. Pr., 8 quarter hrs. clo. constr.**
Pattern blocking in personal and commercial pattern production. Foundation sloper developed for pattern drafting. Consideration given to figure variations and their effect on styling and production.
- 556. Comparative Methods of Apparel Production (5). Lec. 2, Lab. 6. Pr., 8 quarter hours of clothing construction.**
End-use qualities of apparel in relation to options in methods of production and organizational procedures. Implications for consumer decisions and industrial quality control and pricing.
- 575. Creative Textile Design (5). Lab. 9, outside work to be arranged 6. Pr., CA 116, 116L, or AT 121.**
An introduction to various techniques used in the creative decoration of fabric, with experience in the execution of these techniques for both fashion and interior textiles.
- 576. Textile Printing (3). Pr., CA 475.**
Various screen printing techniques, such as cut film, block out, paper stencil, photographic, etc.; applicable to commercial production.
- 583. Soiling and Detergency of Textiles (5). Lec. 2, Lab. 6. Pr., PS 204 or 205, CA 225 or equivalent.**
Physical and chemical principles involved in textile soil deposition and removal. Effect of soil removal methods on functional properties of textile materials.
- 586. Rug Weaving (5). Lab. 15. Pr., CA 385.**
Various rug weaving techniques, history, development, use in hand weaving and application to commercial production.
- 587. Advanced Pattern Weaving (5). Lab. 15. Pr., CA 385.**
Advanced pattern weaves used in hand weaving and applicable to commercial production.
- 588. Experimental Weaving (5). Pr., CA 486, 487.**
Experimental work with yarns, fibers, and related materials, while initiating and solving individual creative problems using advanced weaving techniques. Allows for student interaction and further preparation of portfolio work.
- 593. The House Utility Core (3). Lec. 2, Lab. 2. Pr., CA 233, 333.**
Home wiring, heating and cooling, the use of water in the home, the physical arrangement, and space allocated to their use. To include kitchen, laundry, and bathroom planning.

GRADUATE

- 601. Seminar (1-5). A. Clothing; B. Textiles; C. Design; D. Housing; E. General**
May be taken more than one quarter in residence for a maximum of 10 credits.
- 605. Methods of Research in Home Economics (3). Pr., BY 401 or EC 274 or EC 474.**
Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Home Economics.
- 609. Special Problems a) Clothing, b) Textiles, c) Equipment, d) Housing (2-5). Pr., consent of instructor. May be taken in more than one area for a total of 10 hours.**
- 632. Research Techniques in Housing (5). Lec. 4, Lab. 1. Pr., statistics and consent of instructor.**
Housing research with particular emphasis on survey methods and data analysis.
- 633. Family Housing (5). Lec. 5. Pr., EC 200, SY 201, CA 113.**
The effects of housing on socio-psychological aspects of the individual and family; economic, legal and social implications; present trends.
- 638. Advanced Housing (3). Lecture Lab. 8-12 for 12 days.**
A two-week course offered in the summer quarter. A leader of some renown in the field of housing will be secured to lecture and direct laboratory work in space, form, livability, and other physical aspects of housing. Approved for graduate credit for Master of Science programs.
- 652. Clothing and Textiles Literature (5).**
A critical examination of the current literature in the fields of clothing and textiles.
- 653. Economics of Clothing Consumption (5). Pr., EC 200, CA 205 or equivalent.**
A critical examination of the literature on Clothing and Textiles economics, modern trends in manufacture and distribution and labor laws and their influence on clothing.
- 655. Problems in Home Decoration (5).**
The undergraduate course, CA 313, is used as a basis for advanced work along the same lines. Problems in valuing choice of materials and arrangements of exteriors as well as interiors of the home are made the topic of minor research.

- 658. Chemical and Physical Analysis of Textiles (5). Lec. 3, Lab. 4. Pr., CH 207.**
The theory and application of chemical and physical analytical methods to textiles.
- 659. Structure-Property Relationships of Textile Materials (5). Pr., CH 203.**
Fiber and fabric properties; their dependence upon the chemical structure and molecular arrangement within the fiber, yarn and fabric construction, and fabric finishing.
- 667. Clothing and Behavior (5). Pr., basic courses in Sociology, Psychology, and consent of the instructor.**
Clothing as a factor in the physical, social and psychological environment of man, his response to and use of clothing as an aspect of individual behavior and culture.
- 669. Personality Projection Through Clothing (3). Pr., CA 667; FCD 670 or PG 433.**
Psychological processes and theories of personality in relation to clothing-oriented behavior, as supported by research. Emphasis is placed upon the interrelationships among the self, the body, and clothing at each development stage of the life cycle.
- 699. Research and Thesis. Credit to be arranged.**
Required of all students under the Thesis Option in any field.

Economics (EC)

Professors Chastain, Jones, Ritland, Kern, Kincey, Klontz, and Steele
Associate Professors Stanaland, *Head*, Boston, Hebert, Street, and Whitten
Assistant Professors Bellante, Deyak, Dunlevy, House, Jackson
Long, Saba, and Yeager
Instructor Sherling

- 200. Economics I (5). Pr., sophomore standing.**
Economic principles with emphasis upon the macro-economic aspects of the national economy.
- 202. Economics II (5). Pr., EC 200.**
A continuation of economic principles with emphasis upon micro-economic aspects of the economy.
- 206. Socio-Economic Foundations of Contemporary America (3). General elective.**
The social and economic developments which lead to and help toward an understanding of present day American society.
- 274. Business and Economic Statistics I (5). Pr., MH 151 or equivalent and EC 200 or AEC 202.**
Frequency distribution and time series analysis; index numbers; probability; binomial and normal distributions; introduction to statistical inference.
- 340. Environmental Economics (5). Pr., EC 202 or consent of instructor.**
Economic analysis applied to topical environmental issues such as pollution, preservation vs. development, economic growth, and population.
- 350. Labor Economics (5). Pr., EC 202, junior standing.**
A theoretical and institutional examination of the labor market, including wage theories, unionism, the economics of collective bargaining, and problems of insecurity.
- 360. Money and Banking (5). Pr., EC 200 or AEC 202, junior standing.**
Money, credit and banking including consideration of monetary systems, foreign exchange and commercial banking with relation to the Federal Reserve System.
- 375. Nonparametric Statistics (3). Pr., EC 274.**
The analysis of business and economic data by distribution-free statistical methods.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. Foundations of Economics (5). Pr., Consent of the Director of Graduate Studies, School of Business.**
An accelerated course combining both micro-and macroeconomics and implications for the manager.
- 544. Labor Legislation (5). Pr., EC 350 and EC 545.**
Analysis of background, content, and significance of industrial relations, wage and hour, and selected social security laws.
- 545. Industrial Relations (5). Pr., EC 200.**
Analysis of legislation, collective bargaining, union-management cooperation, and economic conditions bearing upon employer-employee relations. (Credit for MN 444 precludes credit for this course.)
- 551. Intermediate Microeconomics (5). Pr., EC 202.**
The theory of pricing under varying market conditions and distribution of income among the factors of production.

- 552. Comparative Economic Systems (5). Pr., EC 202.**
An analysis of the rival economic doctrines of Capitalism, Socialism, and Communism.
- 553. Economics of Growth and Development (5). Pr., EC 200.**
Concepts, principles and problems of economic growth and development with consideration of appropriate policies for both underdeveloped and advanced economies.
- 554. History of Economic Thought (5). Pr., EC 202.**
The development of economic ideas, principles, and systems of analysis from early times to the present.
- 555. Social Control of Industry (5). Pr., EC 202.**
The economic effects of the control of industry by governmental agencies. Emphasis on the welfare aspects of government regulations.
- 556. Intermediate Macroeconomics (5). Pr., EC 200.**
The measurement of national output, with income and employment theory, general equilibrium theory, and theories of interest, investment, and consumption.
- 557. Economic History of Europe (5). Pr., EC 200.**
Economic contributions of the medieval period; mercantilism; laissez-faire; developments in agriculture, industry, transportation, trade, and banking.
- 558. Economic History of the United States (5).**
Development of the economic institutions, growth of industries, regional specialization, and relation of government to business enterprise from the colonial period to the present.
- 559. Regional Economic Development (5). Pr., EC 200.**
Analytical discussion of the principles associated with the regional development of a national economy. Emphasis is on the problems of lagging regions and on the experience of the United States.
- 560. Introduction to Econometrics (5). Pr., MH 161 or equivalent, AEC 202 or EC 202 or equivalent, and EC 274 or equivalent.**
Formulation of elementary economic models using economic theory and mathematics with certain basic assumptions or axioms. Mathematical tools used in economic analysis.
- 562. Monetary Theory and Policy (5). Pr., EC 360.**
Intermediate monetary theory and policy. Attention given to empirical studies. Substantial readings from original sources required.
- 565. Public Finance (5). Pr., EC 202.**
An examination of the economic rationale of the public sector; supply and demand of public goods. Principles of efficient and equitable taxation and government spending.
- 568. Business History of the United States (5).**
The origins and developmental patterns of American business with an emphasis on the role of the business community in the economic and political evolution of the United States.
- 570. Foundations of Statistics (4). Pr., consent of the Director of Graduate Studies, School of Business.**
An accelerated course designed to provide beginning MBA students with a foundation in statistical concepts, techniques and applications.
- 571. International Economics (5). Pr., EC 551, consent of instructor.**
An examination of the pure theory and monetary aspects of international trade.
- 574. Business and Economic Statistics II (5). Pr., EC 274 or equivalent.**
Probability distributions including the Poisson and "t" distributions; advanced time series analysis; chi square; multiple and partial correlation; statistical decision theory.
- 575. Quantitative Methods of Economics and Business (5). Pr., EC 274.**
Quantitative methods and their application in production and distribution problems of business.
- 580. Business and Economic Forecasting (5). Pr., EC 556 and EC 574 or consent of instructor.**
Forecasting, with emphasis on the interpretation of macroeconomic forecasting methods and the development of competency in forecasting at the level of the firm.
- 585. Mathematical Economics (5). MH 161, EC 551, and EC 556.**
An introduction to mathematical methods in economics. Fundamental propositions of micro and macroeconomic theory are derived mathematically.

GRADUATE

- 600. National Income and Capital Accumulation (5). Pr., EC 556, consent of the instructor or graduate standing.**
Advanced general equilibrium theory with emphasis on the theories of interest, investment, and consumption.
- 601. Value and Distribution (5). Pr., EC 551, consent of instructor or graduate standing.**
Positive content and limitations of modern theories of value, wages, rents, and profits.

- 607. Regional and Urban Economics (3). Consent of instructor, graduate standing.**
The economic forces involved in planning a dynamic urban region, the principles of and applications for regional economic models; the role of quantitative models of urban development in metropolitan policy-making.
- 608. Business Research (5). Pr., EC 202, consent of instructor or graduate standing.**
Methods of collecting, analyzing, and interpreting business and economic data.
- 611. Economic Development (5). Pr., consent of instructor or graduate standing.**
Conceptual and empirical analysis of economic development with emphasis on the lesser developed areas and countries. Analysis of financial and technical aid to other countries and case studies of development problems will be incorporated.
- 622. Theory of Wages and Labor Mobility (5). Pr., EC 350 and EC 551 or consent of instructor.**
Advanced study of various theories of wage determination and of theories and empirical studies of labor supply and mobility.
- 650. Economic Seminar (1-10). Pr., consent of instructor or graduate standing.**
Intensive study and analysis of economic problems.
- 651. Business Conditions Analysis (3). Pr., EC 570, 501, and MN 581 or equivalent.**
Macro-economic theory as it relates to the business environment and business forecasting techniques.
- 654. Advanced History of Economic Thought (5). Pr., EC 554 or consent of instructor**
The development of economic thought with emphasis upon classical and neo-classical authors and their critics. The contributions of each writer are examined in the economic context from which they emerged and their influence on economic thought and national policy considered.
- 656. Price Theory and Business Application (3). Pr., EC 501, 570, MN 581 or equivalent.**
Price theory and applications for managers.
- 658. Seminar in the Economic History of the United States (5). Pr., EC 558, consent of instructor or graduate standing.**
Recent developments in the field of knowledge constituting the economic history of the United States.
- 660. Econometrics (5). Pr., EC 551, EC 574, EC 565, AEC 560.**
Application of mathematics and statistical methods to the problems of economic analysis. Econometric models of the economy as a whole and of individual sectors will be considered.
- 662. Seminar in Money and Banking (5). Pr., EC 360 and consent of instructor.**
Goals, procedures, and achievements in attaining monetary objectives at home and abroad. Special emphasis is given to published research results.
- 665. Seminar in Public Finance (5). Pr., EC 360, EC 565, consent of instructor or graduate standing.**
Theory and principles of public finance at an advanced level with special emphasis on fiscal policy.
- 671. International Economics and Finance (5). Pr., EC 571.**
Advanced foreign trade theory and balance of payments analysis, exchange rates, capital movements, financial institutions. Current problems in international finance.
- 674. Business and Economic Statistics III (5). Pr., EC 574, or equivalent.**
Design of experiments, analysis of variance and covariance, fitting of Gompertz and other growth curves, selected nonparametric statistical methods.
- 675. Managerial Statistics (5). Pr., EC 574 or EC 575.**
Application of classical and Bayesian statistical decision theory in the solution of management problems.
- 690. Special Problems (1-5).**
Variable content in the economics area.
- 699. Research and Thesis. Credit to be arranged.**

Education (ED)

Following the common courses listed below, School of Education courses are listed under their alphabetically arranged departments, Administration and Supervision through Vocational and Adult Education.

UNDERGRADUATE COMMON COURSES

The following special credit options which emphasize laboratory experiences in undergraduate study are available in all undergraduate programs in the School of Education:

- 425. **Professional Internship (15).** Pr., senior standing, admission to Teacher Education prior to Internship, appropriate professional courses.
Provides students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 446. **Directed Independent Study (1-10).**
Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
- 450. **Special Topics (1-5).**
Provides an opportunity for seniors and professors to pursue cooperatively selected concepts and theoretical formulations normally in small groups.
- 495. **Practicum (1-10).**
Provides students with experiences closely relating theory and practice, usually carried on simultaneously.

GRADUATE COMMON COURSES

The following special credit options which emphasize laboratory experiences in graduate study are available in each department in the School of Education:

- 625. **Internship (5-15).**
Provides advanced students with supervised, on-the-job experiences in a school, college, or other appropriate setting. These experiences will be accompanied by regularly scheduled, on-campus discussion periods designed to provide positive evaluation and analysis of the intern experience.
- 646. **Directed Independent Study (1-6).**
Special study in which the student's learning efforts are guided toward desired objectives. Includes evaluation by professor and student of work accomplished at regular intervals.
- 695. **Practicum. (1-15).**
Provides advanced students with experiences closely relating theory and practice, usually carried on simultaneously.

The following research/field project credit options are available in each department according to the levels of degree study offered in the department.

- 699. **Research and Thesis (Credit to be arranged).** May be taken more than one quarter.
- 798. **Field Project. (Credit to be arranged.)** May be taken more than one quarter.
- *799. **Research and Dissertation. (Credit to be arranged.)** May be taken more than one quarter.

The following Curriculum and Teaching courses are available in each department with teaching specialization programs:

- 651. **Research Studies in Education in Areas of Specialization (5).**
Review, analysis, and interpretation of available research with emphasis on designing new research to meet the changing needs of the school.
- 652. **Curriculum and Teaching in Areas of Specialization (5).**
Teaching practices and reappraisal of selecting experiences and content for curriculum improvement.
- 653. **Organization of Program in Areas of Specialization (5).**
Program, organization, and development of basic and supplementary materials for guiding teachers, faculties, and school systems in the continuous improvement of curriculum and teaching practices.
- 654. **Evaluation of Program in Areas of Specialization (5).**
Evaluation and investigation of teaching effectiveness with attention also given to the utilization of human and material resources and the coordination of areas of specialization.

Prerequisites for the 651, 652, 653, and 654 courses are 18 hours of appropriate subject matter and 36 hours of psychology and professional education.

*Not available in EM, FED, and HPR.

Program Designators—When appropriate, certain sections of the above common offerings are identified by programs within the departments by the use of letter designations as noted below:

Elementary Education Department: (A) Elementary (B) Early Childhood (G) Language Arts (H) Mathematics (K) Science, and (L) Social Science.

Health, Physical Education, and Recreation Department: (A) Health Education (B) Physical Education, and (C) Recreation Administration

Secondary Education Department: (A) Art (C) Theatre (D) Foreign Languages (G) English Language Arts (H) Mathematics (J) Music (k) Science (L) Social Science, and (M) Speech.

Vocational and Adult Education Department: (A) Agriculture (B) Industrial Arts (C) Trade and Industrial (D) Distributive (E) Rehabilitation (F) Adult (G) Technical (H) Business (I) Home Economics (K) Office Administration (N) Speech Pathology (O) Behavior Disturbance (P) Mental Retardation (Q) Special Education (R) Learning Disabilities, and (S) Early Childhood for the Handicapped.

Interdepartmental Education (Elementary-Secondary): (A) Art (C) Theatre (E) Gifted (J) Music, and (M) Speech Communication.

Administration and Supervision (AED)

Professors Moore, Morgan, Phillips, Tincher, and Walden, *Head*
Associate Professors Clark, Martin, Scebra, and Watkins
Assistant Professors Barton, Mayfield, and Williams

Prerequisites and corequisites in the Department of Administration and Supervision are experience in teaching or appropriate fields, and employment or definite professional objectives leading to employment in administration or supervision.

- 618. Organization and Administration of Higher Education (5). Pr., IED 663 or IED 665.**
For educational leaders in higher education. The organization, administration, and evaluation of institutions in higher education in terms of the academic program, student personnel services, business affairs, and related programs including relations between higher education and the state and federal government.
- 645. Current Problems and Issues in Educational Administration (5).**
The problems, issues, and trends affecting educational institutions with particular attention to development of administrative procedures to cope with the extensive changes occurring in education.
- 650. Seminar in Area of Specialization (1-10).**
Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.
- 670. Fundamentals of Leadership and Supervision (5).**
Introductory studies of the leadership process including such topics as the theoretical framework in which leadership takes place; the purposes, functions and processes of supervision and leadership; administrative and supervisory tasks and skills; and the methods of evaluating leadership and supervisory roles.
- 681. Organization and Administration of Public Education (5).**
For superintendents, principals, teachers and other educational leaders. Topics include purposes of organization and administration; organization and administration on federal, state, and local levels; financial support and accounting; operation of plant; school-community interaction and personnel administration.
- 683. Advanced Studies of Educational Leadership and Supervision (5). Pr., AED 670 or consent of instructor.**
Advanced study of current theories, concepts, and principles of leadership and their in-depth application to educational roles. Emphasis is placed on the responsibility of the educational administrator for effective leadership in the school and community, and the responsibility for leadership in the continuous development and evaluation of staff competence and role performance.
- 685. Administrative Organization and Behavior (5).**
Current theories and concepts of formal organization and of collective behavior. Includes a social-psychological approach to organizations, and treats current trends in organizing for instruction.
- 686. Administration and Policy Formation (5).**
Analysis of basic social forces, antecedent movements, and political action leading to formal enactment of educational policy at national, state, and local levels. Consideration is given to the roles and functions of governing and regulating boards and agencies.
- 688. School Finance and Business Administration (5).**
Relationships between educational finance, educational program, tax structures, foundation programs and internal accounting. Theories of public finance and economic principles relating to financial support of educational systems at the local, state and federal levels.

689. Educational Plant Maintenance (5).

Relationship of educational plant maintenance and operation to educational program; procedures in educational plant maintenance and operation; safety factors; trends in modernization and new plant planning.

690. Educational Business Management (5).

Procedures and practices in educational finance at the business or operational level. Attention to budgeting, accounting, purchasing, transportation, cost analysis, and management of human and material resources.

691. Educational Plant Planning (5).

Development of educational plants, relationships between curriculum and plant; trends in plant design; analysis of physical conditions, relationships of professional and lay personnel in educational plant planning.

692. Constitutional, Statutory and Judicial Foundations of Education (5).

The constitutional and statutory provisions for education and an analysis of judicial decisions affecting education. Among topics are authority and responsibility of the teacher; rights, privileges and responsibilities of students; use of school property, taxation; curriculum, contracts and retirement provisions; contractual capacity and liability and transportation.

693. Personnel Administration (5).

Assists educational leaders with effective personnel administration and the quality of education. Research results and experimentation in morale, welfare, work loads, pupil accounting, and bases for salary determination as they relate to staff and pupil personnel.

694. Studies for Comprehensive Educational Planning (5).

Principles and procedures for collecting, analyzing, and utilizing data in the process of educational planning, including such topics as: community characteristics, including power structure; economic bases and population; system characteristics, including administrative organization, finance, personnel physical facilities, and instructional program.

697. Student Personnel Work in Higher Education (5). Pr., CED 621.

Theories, principles, practices, organization, administration, and evaluation of student personnel services in higher education.

Counselor Education (CED)

Professors Meadows, Head, Grant

Associate Professors Allen, Donnan, Foy, and Warner

Assistant Professors McEwen and Valine

Adjunct Barnes

Instructor Higgins

Prerequisites and corequisites in the Department of Counselor Education are experience in appropriate fields and employment or professional objectives leading to employment in public school counseling, psychoeducational diagnosis (school psychometry) rehabilitation community counseling, counselor education and college student personnel work. CED 621, CED 622, or equivalent, is a prerequisite or corequisite to advanced study.

321. Leadership in Student Development (3). Pr., sophomore standing and consent of instructor.

For students interested in increasing their understanding and skills in group dynamics and leadership. Particular attention will be paid to application of course content and activities to current co-curricular programs in which students are involved.

ADVANCED UNDERGRADUATE AND GRADUATE

521. Introduction to Guidance and Counseling (5).

Emphasizes understanding guidance relationships in the classroom. Not open to graduate students majoring in guidance and counseling.

523. Medical and Adjustment Aspects of Disability I (5). Pr., consent of instructor.

Orientation to medical and adjustment aspects of the disabled individual. Understanding and using medical and paramedical personnel effectively in the rehabilitation process.

GRADUATE

621. Principles of Guidance and Student Personnel Work (5).

Enables students to develop a conceptual framework for viewing the inter-relationship of guidance and counseling in terms of (1) personal and social factors and (2) their place in a comprehensive program of student personnel work.

622. Introduction to Rehabilitation Counseling (5).

Counseling process in the rehabilitation setting. Focusing also on the historical development, duties, legal background, ethics and the setting.

- 624. Medical and Adjustment Aspects of Disability II (5). Pr., CED 523.**
A continuation of CED 523. Focuses on rehabilitation with the chronically disabled.
- 626. Case Management in Rehabilitation Counseling (5). Pr., CED 622 or consent of instructor.**
A critical analysis of representative rehabilitation cases, and case records. Attention is focused on process, diagnosis, and provision of services.
- 627. Problems in Guidance (5). Pr., consent of the instructor.**
Develops competency in the application of counseling theory and research findings, with special emphasis on educational problems.
- 628. Counseling Theory and Practice I (5). Lec. 3, Lab. 4. Pr. or coreq., CED 621 or 622.**
Presents alternative theoretical strategies of counseling; prepares the student for further study of the theoretical and practical aspects of counseling; and provides field opportunities for practical application of theoretical concepts.
- 629. Counseling Theory and Practice II (5). Pr., CED 628.**
A continuation of CED 628.
- 630. Group Dynamics in Counseling (5). Pr., CED 621.**
Studies in contemporary theories and analysis of concepts, models and pertinent research in group dynamics as it pertains to counseling.
- 631. Group Procedures in Counseling (5). Pr., CED 621, 628.**
The history, philosophy, and principles of group counseling and guidance. Includes pertinent research, and the dynamics of group interaction in counseling settings.
- 632. Organization and Administration of Guidance Programs (5). Pr. or coreq., CED 621.**
For administrative and guidance personnel. Topics discussed include principles of administrative practice, role of staff in regard to the guidance program, organizational patterns for guidance programs, possible ways of initiating a guidance program, and means of evaluation.
- 633. Analysis of the Individual (5). Pr. or coreq.; CED 621; Pr., PG 415.**
Assists teachers and other guidance personnel in acquiring knowledge, understanding and skill necessary to obtain records and appraise information about the pupil as an individual and as a member of a group.
- 634. Counseling in the Elementary School (5). Pr., CED 621.**
Counseling and related activities are considered in the scope of pupil personnel activities as a developmental process in the elementary school.
- 635. Agency Resources and Placement Services in Rehabilitation Counseling (5). Pr., CED 622 or consent of instructor.**
Development and utilization of agency resources of value to the rehabilitation counselor. Emphasis is given to placement services and opportunities in working with the disabled.
- 636. Vocational Appraisal (5). Pr., PG 415 or equivalent and consent of instructor.**
Appraisal of interest, aptitude, and personality tests used in the process of counseling with individuals confronted with vocational decisions. Laboratory practice in test administration, scoring, interpretation, and reporting.
- 637. Theories of Vocational Development (5). Pr., CED 621 or consent of instructor.**
Designed to analyze theories of vocational development with special emphasis on the integration and practical application of the theories in counseling. Students are encouraged to examine their own career development in relation to existing theory in order that they may understand the integral role of career counseling within a total system of career education.
- 638. Information Services in Guidance and Counseling (5). Pr., or coreq., CED 621 or 626.**
Designed to assist counselor develop an understanding of the educational and occupational information service and its relationship to counseling. Emphasis is placed on collection, evaluation and dissemination of all forms of career information. Students have an opportunity to experience the process of career decision making through the use of simulated experiences.
- 647. Supervisory Procedures in Rehabilitation Counseling (5). Pr., AED 670 and consent of instructor.**
Procedures and practices specific to the supervision of rehabilitation counselor and counselor-related services in rehabilitation agencies.
- 648. Planning and Program Development in Rehabilitation Counseling (5). Consent of instructor.**
Trends in program development, planning, and evaluation of research and theoretical writings in the area. A comprehensive study of research and demonstration projects in rehabilitation counseling.
- 650. Seminar in Area of Specialization (1-5). Pr., Consent of instructor. (May be repeated for credit not to exceed 10 hours.)**
Provides for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.

653. Counseling Programs in Higher Education (5). Pr., CED 621.

Emphasizes the integration of counseling functions within the total student personnel program in higher education, legal and ethical aspects of counseling and student personnel work, and communication problems between groups within the institution and community.

654. College Student Development; Implications for Counseling and Student Personnel Work (5). Pr., IED 663.

Emphasis on the developmental characteristics of college students, student culture and environment, student movements, research concerning the diversity of college student population and implications for counseling and student personnel programs.

656. Research and Evaluation in Counseling (5). Pr., FED 661, consent of instructor.

Measurement, appraisal, and evaluation of a broad range of objectives in counseling and guidance. Emphasis on criteria, techniques and research procedures necessary to evaluate counselor programs.

Educational Media (EM)

Associate Professors Miller, *Acting Head*, and Robinson
Assistant Professors Beilke, and Wright
Instructors Anthony, Hines, and Nist

The program in Educational Media leads towards certificate endorsement as school librarian, and certification as media specialist. Basic courses may be elected by majors in other areas.

300. Learning Resources (1-5). May be repeated to include areas A, B, C, and D.

A. Survey of learning resources (2). B. Production of materials (1). C. Planning learning situations (1), and D. The school media program (1).

ADVANCED UNDERGRADUATE AND GRADUATE**510. Media for Children (4).**

Examination and evaluation of printed and other types of materials in view of their relevance to the needs and interests of various age and grade levels of elementary school children. Study of selection aids, principles, and criteria for selecting materials.

515. Media for Young Adults (4).

Study and evaluation of books and other media in relation to the interests, needs, and abilities of young adults.

530. Reference Materials and Services (4).

Study and evaluation of basic reference sources for learning resource centers. Introduction to research methods needed in locating information to support the curriculum of the school.

540. Organization and Administration of Media Centers (4). Pr., EM 300.

Basic organization of books, non-book materials, and services for effective use in media centers. Administering the budget, selection and purchase of materials, preparation of materials for use, circulation of materials, inventory, care and repair of materials, and instruction in the use of media are considered.

550. Classification and Cataloging of Media (4). Pr., EM 300, 510, or 515, 530, and 540.

Principles and procedures of classifying and cataloging books and other printed materials, filmstrips, recordings, and community resources. The vertical file, the Dewey decimal system of classification, Wilson and Library of Congress printed cards, and subject headings are studied.

570. Cybernetic Principles of Learning Systems (4).

The organization of mediated instruction into learning systems designs utilizing feedback control and modification. Includes implications for instructional strategies formed to function in the continuous progress school with special emphasis on the media center.

GRADUATE**600. Technology in Education (4). Pr., EM 400 or its equivalent, or consent of department head.**

Theory, problems, procedures, and standards in the utilization of technology.

605. Modes of Mediated Instruction (4). Pr., EM 600.

Development and integration of media into learning prescriptions. Emphasis is on the assigning of media in a total systems approach to curriculum building.

620. Principles of Media Services (4). Pr., EM 600.

Place and function of media services in the American educational system. Historical development of learning resources centers; media services to teachers and pupils as an integral part of the school program; standards and administrative policies are included.

- 626. Problems in the Administration of Media Services (4). Pr., EM 600.**
Current problems relating to an effective program of media services. Experiences include problem identification and resolution in the field.
- 630. Information Resources in the School and Community (4). Pr., EM 600.**
Community relations: historical background, current trends, problems and programs of service; relation to public and rural library extension service; selection of materials on the basis of community and curriculum needs; book lists and exhibits. Experiences include observation, visitations and fieldwork.
- 650. Seminar in Educational Media (1-10). May be repeated for credit not to exceed 10 hours. Pr., permission of department head.**
Special problems formulated around students' area of specialization designed to engage students in an intensive study and analysis of problems identified.
- 651. Research in Educational Media (5). Pr., 36 hours in Media and professional education.**
Analysis and review of research with an emphasis on the individual's research needs.
- 654. Evaluation of Media Programs (5). Pr., consent of department head.**
An intensive study of factors contributing to effective organizational configurations. Experiences include participation in evaluation of field programs.

Elementary Education (EED)

Professors Coss, *Head*, Cadenhead, Ellisor, and Newell
Associate Professors Allen, English, Noland, and Wright
Assistant Professors Jensen, Justice, Koon, Valine, and VonEschenbach
Instructor Schillings

Orientation

- 101. Career Exploration and Planning (2). Lec. 1, Lab. 2.**
Helps freshmen in planning their professional careers. (See page 126).
- 102. Orientation for Transfer Students (1).**
Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.
- 104. Orientation to Laboratory Experiences for Transfers (1).**
Required of all students completing the Teacher Education Program. Orientation to the total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program.

Reading Improvement

Available as a service course and as a general elective to all University students.

- 310. Reading Improvement (3). Lec. 2, Lab. 2. General elective.**
Developmental reading for students who wish to improve their reading skills. Each student's present degree of reading efficiency is diagnosed and a program structured to his individual needs is planned and conducted.

Curriculum and Teaching

Students are sectioned by area of specialization according to the following designations in certain core courses: (A) Early Childhood Education, (B) Elementary Education, (C) Special Education-Behavior Disturbance, (D) Special Education-Mental Retardation, (E) Special Education-Early Childhood Education for the Handicapped.

- 300. Fundamentals of Reading Instruction (5). Lec. 3, Lab. 4. Pr., sophomore standing.**
Develops competencies in teaching reading skills. Readiness, word recognition, and comprehension will be stressed.
- 301. Curriculum I (10). Pr., EED 300, coreq. FED 214, admission to Teacher Education, junior standing.**
Understandings, skills, and attitudes necessary for planning and implementing language arts and social science curricula are developed in an individualized teaching-learning setting. Laboratory experiences are required.

- 302. Curriculum I, Language Arts (5). Pr., EED 300, admission to Teacher Education, junior standing.**
- 303. Curriculum I, Social Science (5). Pr., admission to Teacher Education, junior standing.**
- 304. Music and Related Arts (5). Pr., junior standing.**
Musical, rhythmic, and artistic activity program in the context of laboratory experiences with children.
- 320. Curriculum for Early Childhood Education I (10). Lec. 8, Lab. 6. Pr., coreq., FED 214, junior standing.**
Language Arts and Social Science curricula appropriate for children ages four through eight. Laboratory experiences are required.
- 396. Music for the Elementary Teacher (3). Lec. 2, Lab. 2. Pr., consent of instructor.**
An elective for Elementary Education or Music Education students. The design of curricula and teaching strategies in grades K-6; includes laboratory experience with children in a public school.
- 401. Curriculum II (10). Pr., coreq., FED 320, junior standing.**
Understanding, skills, and attitudes necessary for planning and implementing elementary mathematics and natural science curricula are developed in an individualized teaching-learning setting. Laboratory experiences are required.
- 402. Curriculum I, Mathematics (5). Pr., junior standing.**
- 403. Curriculum II, Natural Science (5). Pr., junior standing.**
- 420. Curriculum for Early Childhood Education II (10). Lec. 8, Lab. 6. Pr., EED 320, coreq., FED 320.**
Mathematics and natural science curricula appropriate for children ages four through eight. Laboratory experiences are required.
- 451. Analysis of Elementary Instructional Strategies (3). Lec. 2, Lab. 2. Pr., Professional Internship.**
Patterns of elementary curriculum and organization for instruction, including the analysis of previous and current laboratory experiences in education. Attention given to implementation of system's approach in student's area of specialization.
- 455. Analysis of Early Childhood Education Programs (3). Lec. 2, Lab. 2. Pr., EED 420 and Professional Internship.**
Curriculum and organization of early childhood programs are evaluated. Previous and current laboratory experiences are related to current trends in early childhood education. Laboratory activities will be coordinated by the faculties in the Department of Elementary Education, and Family and Child Development.

ADVANCED UNDERGRADUATE AND GRADUATE

- 561. Individualizing the Classroom Reading Program (5). Lec. 3, Lab. 4. Pr., EED 300.**
Helps develop competencies in the use of diagnostic and prescriptive techniques of teaching reading. Strategies for individualizing the classroom reading program will be stressed.
- 570. Reading in the Content Areas in the Elementary School (5). Lec. 3, Lab. 4. Pr., EED 300.**
Helps develop competencies in teaching functional reading in the elementary school. Directed reading activities, specialized skills, and study skills stressed.
- 574. Problems in Improvement of Reading at the Elementary School Level (5). Lec. 3, Lab. 4. Pr. EED 300.**
Designed to develop competencies in teaching functional reading in the elementary school. Directed reading activities, specialized skills, and study skills stressed.
- 596. Music in the Elementary School (5).**
To give the individual teacher a deeper insight into skills, techniques, and knowledge of music. Appropriate materials, adapted to social and musical interests of children, are studied and evaluated.
- 597. Organization of Elementary School Music (3). Pr., EED 303 or IED 423.**
Theory and development of the music program in the elementary school.

GRADUATE

- 620. The Early Childhood Education Program (3-10). Pr., bachelor's degree.**
Curriculum, teaching-learning process, materials, and facilities appropriate for young children will be studied in a laboratory environment.
- 621. Current Trends in Early Childhood Education (5). Pr., EED 620 or bachelor's degree in Early Childhood Education.**
An investigation of developments, issues, and trends in early childhood education curriculum.

- 622. Seminar in Early Childhood Education (3-10). Pr., EED 621. May be repeated for credit not to exceed 10 hours.**
Contemporary problems in early childhood education. Intensive study in areas of interest and need.
- 624. Research in Early Childhood Education (5). Pr., EED 621.**
Review, analysis, and interpretation of research in areas of early childhood education.
- 641. Diagnostic Procedures in Reading (5). Pr., EED 461 or consent of department head.**
Administration, scoring and interpretation of specific reading tests to determine causes of reading disability. Formal and informal evaluation procedures for regular and remedial classrooms. Screening tests for contributing factors to reading disability. Analysis and implication for correction of reading difficulties.
- 642. Remedial Procedures in Reading (5). Lec. 3, Lab. 4. Pr., EED 641 or consent of department head.**
Appropriate individual and group techniques for correcting deficiencies with practice in continuing evaluation of reading difficulties. Use of equipment and materials with children having reading problems.
- 649. The Elementary School Program (5).**
Major curriculum areas and teaching practices in the modern elementary school. Attention given to implications of research and theory for the total elementary school program.
- 650. Seminar in Elementary Education. 3-10 hours. May be repeated for credit not to exceed 10 hours.**
Critical analysis and evaluation in elementary education with emphasis on improving the instructional program. An opportunity to do intensive study on selected topics.
- 656. Directed Individual Study in Reading Diagnosis and Reading Remediation (5). Pr., EED 642 or consent of department head.**
Clinical experiences in diagnosing problems in reading and related areas. Also clinical experiences in the remediation of reading problems.
- 657. Individualizing Instruction in Elementary Schools (5).**
Analysis of programs of individualizing instruction. Emphasis will be on design, implementation, and management.

Foundations of Education (FED)

Associate Professors Robison, Head, Greenshields, Lauderdale, and Littleford
Assistant Professors Gamble, Goldstein, G. M. Halpin, G. W. Halpin, Hatcher,
Miller, Schuessler, Spencer, Trentham, and Wilmoth
Instructors Guthery, Herring, McCullers, Rice, and Rudder
Adj. Instructor Warner

- 213. Human Growth and Development (5). Lec. 4, Lab. 2. Pr., sophomore standing.**
Analysis of the function of the teacher and the school in the direction, measurement, and evaluation of individual growth and development by using various sociological, philosophical, and psychological theories. Laboratory experiences required.
- 214. Psychological Foundations of Education (5). Lec. 4, Lab. 2. Pr., sophomore standing.**
The psychological dimensions of the educational process. The processes, conditions, and evaluation of learning, and related methodologies of teaching. Laboratory experiences and evaluation of the Pre-teaching Field Experience. For description of the Pre-teaching Field Experience Program, see Professional Requirements, Sect. C under School of Education.
- 320. Social Foundations of Education (5). Lec. 4, Lab. 2. Pr., junior standing.**
An analysis of the relationship of the school and contemporary society and the influence of cultural heterogeneity upon the teaching-learning process. Laboratory experiences focus upon mastering basic tools for studying the school as a dynamic social system.
- 480. Philosophical Foundations of Education (5). Pr., FED 320 or equivalent.**
The development of educational movements and ideas in Western culture which influence modern educational practices. Evaluation of laboratory experiences and the Professional Internship through philosophical analysis of educational concepts and problems.
- 490. Evaluation in Education (3). Lec. 2, Lab. 2. Pr., senior standing.**
Analysis of methods, procedures, and evaluative instruments for determining teaching effectiveness and the attainment of educational goals. Examination of theories and methods of testing, measurement, self-evaluation, and pupil accounting. Techniques, uses and interpretation of educational statistics. Laboratory experiences in the public schools.

ADVANCED UNDERGRADUATE AND GRADUATE

- 520. Educational Sociology (5). Pr., FED 320 and SY 201 or equivalents.**
Analysis of the school as a social institution. Group interaction, formal and informal structure and organization, and the relationship of education to other social institutions.

- 534. Personality Dynamics and Effective Behavior (5). Pr., ten hours of psychology.**
Analysis of adaptive and maladaptive behavior. Not open to students majoring in psychology.

GRADUATE

- 600. Education in Modern Society (5). Pr., graduate standing.**
Analysis and interpretation of the interaction of historical, philosophical and sociological considerations affecting education in modern society.
- 601. Social Foundations of Education (5). Pr., graduate standing.**
Analysis of man as a social being, his social relationships and inventions, and value patterns. Directions and support of educational developments in relation to various socio-economic structures.
- 602. Social Change and Educational Development (5). Pr., graduate standing.**
Major current theories of social change and their practical application in improving the school and directing social innovations which sustain educational improvements.
- 605. Urbanization and Educational Development (5). Pr., FED 600.**
Developments in the concentration of population, wealth, and cultural dissemination in urban areas. The changing character of this concentration, and its impact on educational agencies regarding different population groups and different areas of educational service.
- 617. Advanced Educational Psychology (5). Pr., FED 213 and 214 or equivalents. (Not open to students with credit in FED 451.)**
In-depth analyses of the psychological bases of learning. Particular emphases are the development and modification of cognitive and affective behavior.
- 630. Education and Culturally Disadvantaged People in America (5). Pr., FED 600.**
Areas and extent of cultural disadvantage and its relation to education. Shifting concentrations of disadvantage in relation to patterns of population growth and cultural development. Educational aims and procedures in preventing and remedying cultural disadvantage.
- 634. History of Education (5). Pr., FED 600.**
The emergence of education as a formal institution, tracing its historical development from early Greek times to the present and emphasizing the historical antecedents which have helped to shape the role and functions of education in Western culture.
- 636. Philosophy of Education in America (5). Pr., FED 600.**
Major American contributions to the philosophy of education and their influence on educational practice. Need for, and procedures in, reexamining concepts in the light of recent scientific and cultural developments.
- 637. Development and Status of Educational Philosophy (5). Pr., FED 600; FED 636 or consent of department head.**
Development of philosophy of education from the standpoint of its implications for educational practice. Several patterns of thought are considered including supernaturalism, idealism, realism, humanism, communism, existentialism, and experimentalism.
- 639. Comparative Education (5). Pr., FED 600; two quarters of graduate study or consent of department head.**
Comparative study of selected educational systems in nations in various stages of development. Special attention given to American educational issues in cross cultural contexts.
- 645. Current Problems and Issues in the Foundations of Education (5). Pr., teaching experience.**
Interpretation of selected issues in the sociological, psychological, historical and philosophical foundations of education which affect the total educational enterprise and its relation to society.
- 647. Foundations in Curriculum and Teaching (5).**
Development of curriculum patterns and teaching materials reviewed in terms of recent investigations and experimentation; conflicting conceptions of the nature of the curriculum and the sociological, philosophical and psychological implications of these conflicts; methods of curricular reorganization in the elementary and secondary schools.
- 650. Seminar in Foundations of Education (3-10). May be repeated for credit not to exceed 10 hours.**
Consideration of historical, philosophical, sociological, psychological, and research issues and their impact on education.
- 661. Research and Experimentation in Education (5).**
Emphasis given to research methods, design of experiments, and evaluation; data sources, research planning, elements of scientific method and proposal writing. Current trends in educational research.
- 672. Statistical Methods in Education (5).**
The need and importance of applying statistical methods to the study of educational problems, statistical methods appropriate to education, and interpretation of meanings of statistical analyses.
- 673. Research and Experimental Design (5). Pr., FED 672.**
Relationship of design to validity; significance of variables, testing hypotheses, evaluation of research and research findings.
- 675. Advanced Statistical Methods in Education (5). Pr., FED 672.**
Analysis of variance and covariance; correlation analysis and linear regression. Simple and complex factorial designs applied to educational research.

676. Advanced Research and Experimental Design (5). Pr., FED 675.

An extensive examination of the nature and character of experimental design in educational research including the development of appropriate analytical techniques.

Health, Physical Education and Recreation (HPR)

Professors Fourier, *Head*, Francis, and Means

Associate Professors Dragoin, Fitzpatrick, Moore, Puckett, and Young

Assistant Professors Bengtson, Bond, Cherellia, Daniels, Ford,

Martincic, Morgan, Newkirk, Rosen, Waldrop, Washington, Waters, and Wilson

Instructors Brown, Goss, Milliron, Murphy, Nunnally, Pylant, Reese, and Smith

The instructional program of the Department of Health, Physical Education and Recreation comprises (1) courses in physical education for students in the University liberal education program; (2) courses for students majoring or minoring in health education, physical education, and recreation administration; and (3) courses for students in preparation for teaching.

University Physical Education Requirements

Three quarters of physical education are required by the University for graduation. Any deficiencies in physical education incurred at Auburn University or elsewhere must be cleared prior to graduation. Only one credit per quarter is permitted or transferable to meet the three-quarter requirement.

Health Classification. A student who has completed a Physical Education Classification Form indicating a physical restriction must report to the Physical Education Office, 2050 Memorial Coliseum, for counseling and assignment of a health card indicating suitable classes. Students may request re-classification whenever changes in health status or physical condition occur.

Course Requirements: Students with no physical restrictions are required to take PE 101, Foundations of Physical Education. **THOSE WHO DO NOT HAVE SUFFICIENT SKILL IN SWIMMING TO ASSURE THEIR OWN SAFETY IN AND AROUND WATER ARE REQUIRED TO TAKE PE 102, Beginning Swimming** (Department of Health, Physical Education, and Recreation administers a test to determine each student's swimming ability.) Students who take swimming choose one course from Group I or II listed below for their third quarter's work. Students who do not take a swimming course must select one course from Group I and one course from Group II in completing their three quarters of physical education.

Students with physical restrictions are required to take PE 101, Foundations of Physical Education, or PE 100, Foundations of Physical Education for the Atypical as marked on their health cards. During subsequent quarters they are expected to meet the other requirements stated above as nearly as medical restrictions will allow. Specific course selection should be made on the recommendations of the Department of Health, Physical Education and Recreation.

Full participation in the Band should substitute for one of the three required quarters. Band members should complete the last two-thirds of the Physical Education sequence; swimming and one other course, or one from Group I and II if student passes the swimming classification test.

Students with six months to one year military service receive credit for PE 101, more than one year of service are exempted from all Physical Education requirements with one exception; swimming should be completed unless the student passes the departmental proficiency test.

The extent of participation in the required Physical Education program for students over 26 years of age should be judged by their Academic Deans; unless all or part of the requirement is waived by the Dean, these students should enroll for the last two-thirds of the required sequence.

Varsity athletics scheduled in season for three quarters satisfies the three quarters requirements. Each should pass the departmental proficiency swimming test or enroll in PE 102 Beginning Swimming.

Credit. All courses carry one hour credit per quarter (maximum of six quarter hours allowed on degree). No student may receive credit for a course in which he has previously earned credit.

Students may not register for a beginning level course (Groups I and II) after having earned credit in the sport or dance area on an advanced level (Group III). Credit cannot be earned for a 200 and a 300 level course in the same sport.

Electives. Three quarter hours credit may be earned in addition to the three quarter hours required. Elective courses may be chosen from Group I, II, and III.

100. Foundations of Physical Education for the Atypical (1).

Designed for the individual with anatomical and functional defects.

101. Foundations of Physical Education (1).

Understanding the relationship of human movement to body efficiency, aesthetics and health; self-appraisal; development of a personal plan for achieving and maintaining physical condition; selection of a personal program of developmental and recreational activities.

102. Beginning Swimming (1).

Knowledge and skill in aquatics which are developed to a level sufficient to support a recreational interest and to assure one's own safety and the safety of others in and around water.

103. Swimming for the Atypical (1).

Provides water therapy, an understanding of adaptive movements, and aquatic skills.

107. Sports and Dance in American Culture (1). (Atypical).

114. Recreational Sports for the Atypical (1).

Survey of recreational pursuits for students with physical limitations: billiards, bicycling, croquet, darts, hiking, horseshoes, net games, and shuffleboard.

115. Adapted Physical Education (1).

Concerned with the improvement and correction of physiological and anatomical remedial defects.

Group I (Vigorous)*

116. Weight Control (1).

Caloric intake-output, nutrition, and the development of desirable exercise and nutritional habits. Activities selected according to individual needs and limitations. Open to students with health classifications "A", "B", and "C".

125. Basketball (1).

127. Soccer-Speedball (1).

130. Boxing (1).

131. Fencing (1).

132. Wrestling (1).

134. Judo (1).

135. Weight Training (1).

136. Track (1).

137. Handball (1).

138. Raquet Ball (1).

139. Wilderness Skills (1).

140. Apparatus (1).

Understanding of gymnastics and skill in the use of different apparatus.

141. Trampoline (1).

142. Tumbling (1).

145. Contemporary Dance (1).

An understanding of dance as an art form.

146. Tap Dance (1).

147. Ballet (1).

Fundamentals and terminology of classical ballet.

Group II (Recreational Skills)**

150. Intermediate Swimming (1).

*Vigorous activities having special value with respect to development and maintenance of physical conditions.

**Activities having special value as healthful, lifetime recreational pursuits.

153. **Springboard Diving (1). Lab. 3. Pr., classified as intermediate swimmer or above.**
Instruction in the basic dives: front, back, inward, reverse, and twist.
155. **Angling (1).**
Skills in bait and fly casting. Selection and care of tackle.
156. **Archery (1).**
157. **Badminton (1).**
158. **Bowling (1).**
Additional \$20.00 fee is payable to cooperating agency.
159. **Golf (1).**
162. **Rifle Marksmanship (1).**
163. **Tennis (1).**
165. **Camping (1).**
Understanding of American heritage in relation to the out-of-doors, camping trends, conservation, and the development of camping skills.
166. **Family Recreation (1).**
Leisure time activities suitable for the family.
168. **Basic Equitation (1).**
Additional \$75.00 fee is payable to cooperating agency.
170. **Folk Dance (1).**
172. **Social Dance (1).**
Mixers, as well as ballroom dances: foxtrot, waltz, rhumba, tango, and other representative Latin dances.
180. **Softball (1).**
181. **Volleyball (1).**

Group III (Advanced—Elective)

250. **Synchronized Swimming (1).**
A creative approach to individual and group composition of water ballet stunts and stroke adaptations.
251. **Life Saving (1).**
Skills leading to certification in Red Cross Senior Life Saving.
255. **Skin Diving (1). Lec. 1, Lab. 2. Pr., classified as advanced swimmer.**
Underwater swimming. Includes selection and use of swim fins, mask, and snorkel. Underwater physiology and safety are emphasized.
259. **Advanced Golf (1).**
Additional green fee to be paid to cooperating agency.
263. **Advanced Tennis (1).**
325. **Varsity Basketball (1).**
326. **Varsity Football (1).**
332. **Varsity Wrestling (1).**
336. **Varsity Track (1).**
337. **Varsity Cross Country (1).**
340. **Competitive and Exhibitional Gymnastics (1).**
350. **Varsity Swimming (1).**
359. **Varsity Golf (1).**
362. **Varsity Riflery (1).**
363. **Varsity Tennis (1).**
380. **Varsity Baseball (1).**
381. **Varsity Volleyball (1).**

Courses for the Major and the Minor

118. **Skills and Concepts of Individual and Dual Activities I (3). Lab. 6.**
Track and Field, archery, golf, wrestling and other individual and dual activities.
119. **Skills and Concepts of Individual and Dual Activities II (3). Lab. 6.**
Tennis, badminton, racketball, squash and handball
120. **Skills and Concepts of Gymnastics (4). Lab. 8.**
Tumbling, trampoline and apparatus

121. **Skills and Concepts of Aquatics (2). Lab. 4.**
Strokes, survival swimming techniques, competitive swimming, springboard diving, and other aquatic activities.
122. **Skills and Concepts of Team Sports (3). Lab. 6.**
Power volleyball, soccer, speedball, basketball, softball, field hockey and other team sports.
123. **Skills and Concepts of Dance (4). Lab. 8.**
Contemporary, folk, square, tap and ethnic dance.
195. **Health Science (3).**
Basic understanding concerning sound health practices and protection. Physical, mental, and social aspects of personal and community health are considered.
201. **History and Principles of Physical Education (3).**
202. **Basketball (Men) (3). Lec. 2, Lab. 2. Fall.**
The fundamental skill techniques of basketball—offense, defense, and strategy.
203. **Baseball (3). Lec. 2, Lab. 2.**
Offensive and defensive strategy, pitching, catching, infielding, outfielding, batting and baserunning.
204. **Track and Field (3). Lec. 2, Lab. 2.**
Fundamental skills and techniques of track and field athletics. The organizing and conducting of track meets.
206. **Football (Men) (3). Lec. 2, Lab. 2. Winter.**
The fundamentals of football and the different types of offense, defensive team strategy and generalship.
207. **Conduct of Dance for High School and Recreation Programs (3). Lec. 2, Lab. 2.**
208. **Theory and Conduct of Team Sports for Women (3). Lec. 2, Lab. 2.**
209. **Theory and Conduct of Individual and Dual Sports (3). Lec. 2, Lab. 2.**
210. **Theory and Conduct of Gymnastics (3). Lec. 2, Lab. 2.**
211. **Sensorimotor Activities (3). Lec. 2, Lab. 2.**
Designed to develop understandings and skills concerning the broad concept of sensorimotor experiences for children, ages 4-8.
212. **Elementary School Activities (3). Lec. 2, Lab. 2.**
Physical education activities suitable for the first six grades including teaching devices.
213. **Dance for Children (3). Lec. 2, Lab. 2.**
Includes all forms of dance suitable for elementary school age children with emphasis on creative dance activities which afford a progression in dance skills.
224. **Football Officiating (1). Lab. 3.**
225. **Basketball Officiating (1). Lab. 3.**
226. **Softball Officiating (1). Lab. 3.**
227. **Volleyball Officiating (1). Lab. 3.**
295. **School and Community Health (3).**
315. **Kinesiology (4). Lec. 3, Lab. 2. Pr., ZY 250-251, Physics 200.**
316. **Evaluation and Measurement in Health, Physical Education (3).**
351. **Water Safety (3). Lec. 1, Lab. 4. Pr., current Red Cross Sr. Life Saving Certificate.**
American Red Cross Advanced Swimmer and Water Safety Instructor courses leading to certification.
370. **Dance Survey (3). Lec. 2, Lab. 2.**
Explores choreographic structures of styles and types of dance in relation to music, drama, architecture and art.
372. **Dance Production and Rhythmic Demonstrations (3). Lec. 2, Lab. 2.**
Apprenticeship in producing dance programs, exhibitions of physical activity and festivals.
385. **Principles of Recreation (3).**
The significance and meaning of leisure; theories of play; the recreation movement in the United States. Principles of program planning and development at state and local levels of government, in schools and in industry.
386. **Recreation Leadership (3).**
387. **Outdoor Recreation (3).**
388. **Camp Management (3).**
394. **Elementary School Health Instruction (3). Lec. 2, Lab. 2.**
395. **Secondary School Health Instruction (3). Lec. 2, Lab. 2.**
396. **Drug Use and Abuse (3).**
Investigation of stimulants and depressants with special emphasis on alcohol, narcotics, and tobacco. The effects of these substances on the human body and the social, economic, and community problems associated with their use.
404. **Athletic Injuries (3).**

405. **Physiology of Exercise (4).** Lec. 3, Lab. 2. Pr., ZY 250-251.
416. **Adaptive Physical Education (3).** Lec. 3. Spring. Pr., HPR 315, ZY 250-251.
Review of anatomy, physiology, and psychology pertaining to special programs of physical education for the temporarily and permanently handicapped, with laboratory practice in posture training and remedial gymnastics.
485. **Social Recreation (3).**
494. **Emergency Care and First Aid (3).** Lec. 2, Lab. 2.

ADVANCED UNDERGRADUATE AND GRADUATE

509. **Advanced Health Science (5).** Pr., consent of instructor.
Principles and concepts basic to the improvement of individual and group living and the role of the home, school, and community in the development of sound physical and mental health.
517. **Physical Education for the Mentally Retarded (3).** Lec. 2, Lab. 2.
The motor characteristics of the mentally retarded and the design of special programs of physical education. involves working with mentally retarded children.
519. **Current Problems in Health Education (5).** Pr., consent of instructor.
520. **Sociology of Sport (5).**
Sport and culture. Attention is given to social processes and human behavior in sport situations.
572. **Dance concepts and Related Classroom Experiences (5).**
580. **School-Community Recreation (5).**
Analysis of recreation as it relates to the school and the community.
597. **Drug Abuse Education (5).** Pr., consent of instructor.
Designed to provide a practical and working understanding and means of response to drugs and drug abuse problems to prospective and in-service teachers, counselors, administrators, pharmacists, law enforcement personnel, nurses and other. Interdisciplinary team instruction is utilized.

GRADUATE

619. **Scientific Principles Applied to Physical Education and Athletics (5).** Pr., undergraduate major or minor in health and physical education.
Specific application of physics, physiology, and psychology to the development of physical skills and related topics including reaction time, motivation, maturation, illusions, morale, and problems of group social living in physical education and athletics.
626. **Physical Fitness, a Critical Analysis (5).** Pr., ZY 250-251 or consent of department head.
669. **Advanced Physiology of Exercise (5).** Pr., HPR 405 or equivalent.

Professional Courses

101. **Career Exploration and Planning (2).** Lec. 1, Lab. 2.
Helps freshmen in planning their professional careers (See page 126).
104. **Orientation for Transfer Students (1).**
Helps transfers from other curricula to understand teacher education and teaching as a profession.
108. **Orientation to Laboratory Experiences for Transfers. (1).**
Required of all students completing the Teacher Education Program. Orientation to the total laboratory experiences program in the School of Education with specific attention to the orientation and initiation of the pre-teaching field experiences program.
414. **Teaching in Health and Physical Education in Elementary and Secondary Schools (3).** Lec. 2, Lab. 2. Pr., FED 320 or equivalent, and admission to Teacher Education.
(For description, see Interdepartmental Education.)
423. **Program in Area of Specialization (3-5).** Lec. 2, Lab. 2. Pr., FED 320 or equivalent and admission to Teacher Education.
496. **Problems of Health Education and Health Observation of School Children (5).** Pr., junior standing.
Helps the teacher with the details of health observation, aids in health guidance of individual pupils, acquaints the teacher with the health services available through local and state departments.

GRADUATE

The following course is organized and taught on a twelve-grade basis.

650. Seminar in Health, Physical Education, and Recreation (1-10). Pr., graduate standing.

Provides an opportunity for advanced graduate students and professors to pursue cooperatively selected concepts and theoretical formulations.

Interdepartmental Education (IED)

Included in this section are program areas and course listings designed and taught on the interdepartmental basis. The subheadings reflect the nature and scope of the offerings.

101. Career Exploration and Planning (2). Lec. 1, Lab. 2.

Helps undeclared freshmen in planning their professional careers. (See page 126).

Curriculum and Teaching—Elementary-Secondary Teaching, Program, and Internship

Students in either secondary or elementary education pursuing a curriculum leading to K-12 certification for teaching in a particular field in elementary and secondary schools will take the Teaching and the Program courses in the teaching field in which certification is expected.

414. Teaching in Elementary and Secondary Schools (3). Lec. 2, Lab. 2. Pr., FED 320 or equivalent. Admission to Teacher Education.

(A) Art, (C) Theatre, (J) Music, (M) Speech Communication, (N) Speech Pathology

423. Program in Elementary and Secondary Schools (3). Lec. 2, Lab. 2. Pr., FED 320 or equivalent. Admission to Teacher Education.

(A) Art, (C) Theatre, (J) Music, (M) Speech Communication, (N) Speech Pathology.

GRADUATE

648. Advanced Study of Curriculum and Teaching (5). Pr., FED 647 or consent of instructor.

Major issues, frontier developments, and trends in the improvement of curriculum and teaching in elementary and secondary schools.

658. Seminar and Independent Study in Curriculum and Teaching (5). Pr., FED 647 and IED 648 or consent of instructor.

Research and experimentation in elementary and secondary schools in the development of education programs and the improvement of teaching and learning. Appraisal of significant curriculum research, exploration of areas of needed research in curriculum and instruction, and study of fundamental criteria and methods for solving curriculum problems.

Special Education (Behavior Disturbance, Early Childhood Education for the Handicapped, Mental Retardation, and Speech Pathology)

376. A Survey of Exceptionality (5).

An introduction to the several types of exceptionality with an emphasis upon the educational and training implications of each.

377. Introduction to Mental Retardation (5). Pr., IED 376 or consent of instructor.

An introductory exploration of mental retardation as a special type of exceptionality with emphasis placed upon implications for the education and training of the retarded.

378. An Introduction to Behavior Disturbance (5). Pr., IED 376 or consent of instructor.

An introductory exploration of behavior disturbance as a special type of exceptionality with emphasis placed upon implications for the education and training of the behavior disturbed.

420. Organizing Instruction for Special Education (5). Lec. 4, Lab. 4. Pr., IED 376, IED 378, IED 479-0 or consent of instructor.

Provides the student with skills necessary to organize a total school program for disturbed children and youth.

- 425. Professional Internship in Special Education (15). Pr., admission to Teacher Education one quarter prior to Internship, appropriate professional courses, senior standing.**
(For description, see Professional Internship in School of Education Section). (P) Mental Retardation. (O) Behavior Disturbance. (N) Speech Pathology.
- 479. Methods and Materials for Teaching in Special Education (5). Pr., IED 376 and IED 377 or IED 378.**

ADVANCED UNDERGRADUATE AND GRADUATE

- 530. Learning Disabilities (5). Pr., consent of instructor.**
Theoretical issues, research, diagnosis, and educational approaches involved with children with learning disabilities. Observations of educational settings for children with learning disabilities are required.
- 550. Language Development for the Young Handicapped Child (5). Pr., consent of instructor.**
A systematic, analytic approach to intervention programming for speech and language development with the young handicapped child.
- 580. Education of Children With Special Learning Disabilities (5). Pr., admission to Teacher Education.**
Existing theories and instructional programs for children with special learning disabilities. Administrative arrangements, classroom management, individual educational evaluation and programming are emphasized.
- 586. The Severely Mentally Retarded (5). Pr., consent of instructor.**
An in-depth study of severe mental retardation as a special type of exceptionality with emphasis upon implications for the education and training of the severely retarded.

GRADUATE

- 600. Advanced Study of Exceptionality (5). Pr., Appropriate undergraduate preparation in Special Education or consent of instructor.**
The several types of exceptionality with an emphasis upon the educational and training implications of each.
- 601. Advanced Study of Educational Aspects of Mental Retardation (5). Pr., IED 600, or consent of instructor.**
Mental retardation as a special area of exceptionality, emphasizing the education and training needs of the retarded.
- 602. Educational Diagnosis and Assessment for Special Learning Problems (5). Pr., IED 376 and FED 617.**
Tests and procedures for diagnosing special learning problems. In-depth instruction in educational assessment in such areas as: perceptual-motor, language, academic aptitude, and achievement.
- 603. Prescriptive Teaching for Special Learning Problems (5). Pr., IED 376, 602 and FED 617.**
In-depth instruction in specialized methods of prescriptive program planning based on educational assessments of children with learning problems. Development and presentation tasks are included.
- 643. Education of the Physically Handicapped (5). Pr., adequate courses in physiology and psychology.**
Characteristics of major physical disabilities; the psychology of the physically handicapped; the educational objectives with curriculum adaptations; and related aspects of a total program for the physically handicapped.
- 650. Teaching the Mentally Retarded (5). Pr., IED 376, 377 and IED 479.**
Observation and participation under supervision in education programs for the mentally retarded. Lectures and discussions will implement the student's work in the classroom. Students will develop and evaluate plans and programs for the special class. (For teachers pursuing a program of education for mentally retarded children.)
- 670. Educational Procedures for Children With Behavior Disorders (5). Pr., consent of instructor, graduate standing.**
Analysis of current provision for children with emotional conflicts, with emphasis on educational procedures and implications for learning disabilities.
- 671. Current Research on the Behavioral Disorders of Children (5). Pr., consent of instructor, graduate standing.**
Examination and interpretation of research. Emphasis on education implications of emotional conflict, classroom guidance and control.

Higher Education**GRADUATE**

The courses described below along with AED 618 and AED 697 are designed especially for advanced students who are interested in positions in colleges, universities, and other post secondary-school institutions.

645. Problems of Teaching the Marginally Prepared College Student (5). Pr., IED 665 or IED 666 or consent of instructor.

Socioeconomic and cultural backgrounds as they affect learning styles of the marginally Socioeconomic and cultural backgrounds as they affect learning styles of the marginally prepared student. Develop methods of appropriate teaching strategies as a means of improving the self-concept of these students.

649. The Community College Program (5).

The comprehensive community-junior college designed to improve competencies in program planning, evaluation, and administration.

663. The American College and University (5).

Philosophy and function, the university and social change, the community college, academic freedom, student-faculty-community relationships: international flow of educational ideas, government cultural programs, higher education and the state.

665. The Community College (5).

The rise and development of the community/junior college in American education: its history, philosophy, and functions.

666. Undergraduate Instruction in Higher Education (5). Pr., IED 663 or IED 665 or consent of instructor.

The development and selection of appropriate curricular materials and effective teaching strategies. Evaluation of instruction and learning effectiveness in undergraduate programs of higher education.

The above courses, along with AED 618, AED 697, CED 653 and CED 654 constitute a core for the development of programs of study in higher education. Other offerings, in both academic and professional fields, are available for the completion of advanced programs. These include administration and supervision; foundations of education; psychology; student personnel; vocational and technical education; and professional and academic preparation for teaching in agricultural sciences, business administration, economics and sociology, English, health and physical education, history, home economics, mathematics, music, philosophy, physical and biological sciences, and speech.

Secondary Education (SED)

Professors Atkins, *Head*, Easterday, and Weaver

Associate Professors Alley, Graves, and Justice

Assistant Professors Johns, Henry, Ley, Rowsey and Solomon

Adjunct Instructor Amason and Danner

101. Career Exploration and Planning (2). Lec. 1, Lab. 2.

Helps freshmen in planning their professional careers. (See page 126).

102. Orientation for Transfer Students (1).

Helps transfers from other curricula and students enrolled in other schools to understand teacher education and teaching as a profession.

104. Orientation to Laboratory Experiences for Transfers. (1).

Required of all students completing the Teacher Education Program. Orientation to the Total Laboratory Experiences Program in the School of Education with specific attention to the orientation and initiation of the Pre-Teaching Field Experience Program.

201. Education (2).

Designed to help prospective teachers in the guidance of students. (A) Art Expression, (J) Music Experiences, (P) Communication Problems, (Q) Materials of Instruction, (R) Improvement in Reading.

201L. Education (1). Lab. 2.

Laboratory will be taken concurrently with the corresponding lecture course or independent of the lecture.

Curriculum and Teaching

Undergraduate students in secondary education with a teaching major and minor in secondary education only will take one course in Teaching and one course in Program in the major field and one course in either Teaching or Program in the minor field. Where no minor exists, the latter is not required.

Students in secondary education may pursue a curriculum leading to certification for teaching in selected subject-matter fields in both the elementary and the secondary school. When this type program is pursued, certification requires that the student complete both the Teaching and the Program courses in the teaching field or fields in which certification is expected. Teaching fields for the twelve-grade program include health, physical education and recreation, industrial arts, and the subject-matter areas listed under Interdepartmental.

Teaching and Program courses may be scheduled and taught as separate courses, related courses, or as a unified program.

Admission to Teacher Education is a prerequisite for these courses.

400. Applied Linguistics for Foreign Language Teachers (3).

The Application of linguistics in the teaching of foreign languages.

401. Language Study for Teachers (5).

Linguistics in the school curriculum: the child's acquisition of syntax; theories of teaching usage, dialectology, lexicography, and grammar; English as a second language, non-verbal communication in the classroom; research studies in language and linguistics and their applications to classroom teaching.

402. Rhetoric and Composition for Teachers (5).

Topics and current trends in teaching rhetoric and composition. Classical and new rhetorics; theories of paragraph analysis, behavioral approaches to composition; pupil motivation and the composing process; current research; evaluation.

405. Teaching in Secondary School (3). Lec. 2, Lab. 2. Pr., FED 320, or equivalent.

410. Program in Secondary School (3). Lec. 2, Lab. 2. FED 320, or equivalent.

411. Teaching English: Language and Linguistics (3). Lec. 2, Lab. 2. Pr., FED 320, or equivalent.

Specific teaching strategies in language and linguistics.

412. Teaching English: Literature (3). Lec. 2, Lab. 2. Pr., FED 320, or equivalent.

Specific teaching strategies in literature.

413. Teaching English: Rhetoric and Composition (3). Lec. 2, Lab. 2. Pr., FED 320, or equivalent.

Specific teaching strategies in rhetoric and composition.

ADVANCED UNDERGRADUATE AND GRADUATE

570. Reading in the Content Areas of the Secondary School (5).

Reading problems in content areas of the secondary school and special methods of helping students overcome these problems.

575. Problems in Improvement of Reading at the Secondary School Level (5). Pr., teaching experience or consent of instructor.

Problem areas of effective reading instruction in developmental reading. Grades seven through twelve. Emphasis on techniques and materials for the teaching of comprehension, study skills, vocabulary, and other related areas in the reading program and in the content areas of the secondary school.

576. The Reading of Adolescents (5). Pr., SED 575 and EM 515 or consent of instructor.

Use of adolescent and popular adult literature in the secondary school reading program. Motivation of the reluctant reader; criteria for evaluating reading materials; and self-selection/self-pacing reading programs in the English or reading classroom.

594. Organization of Instrumental Music (3). Pr., IED 414.

Theory and practice in the organization and administration of instrumental music in public schools.

595. Organization of Choral Music (3). Pr., IED 414.

Theory and practice in the organization and administration of choral music in public schools.

GRADUATE

649. The Secondary School Program (5).

For advanced graduate students. Major curriculum areas and teaching practices in the modern secondary school. Attention given to implications of research and theory for the total secondary school program.

650. Seminar (3-10). May be repeated not to exceed 10 hours.**Vocational and Adult Education (VED)**

Professors Montgomery, Head, R. A. Baker, Jarecke, Kurth, and Scarborough

Associate Professors Frank, J. Jarecke, and Smith

Assistant Professors Anderson, Bond, Brown, Couch, Diebold, Drake, Ensminger, Hale, Hanson, Hartzog, Hayes, Joiner, McCall, Miller, Morgan, Patterson, Stewart, Terry, and Williams

Instructors C. Adams, G. Adams, Rudder, and Walls,

Adjunct Instructor Street, DeBeer

Research Associates Brolin, Burks, Cosgrove, Davis, Freeman, Helm,

Gross, Kaufman, Lesnik, McDaniel, Roberts, and Shinnick

101. Career Exploration and Planning (2). Lec. 1, Lab. 2.

Helps freshmen in planning their professional careers.

102. Orientation for Transfer Students (1).

Helps transfers from other curricula and students pursuing the dual objectives program to understand teacher education and teaching as a profession.

104. Orientation to Laboratory Experiences for Transfers (1).**200. Typewriting I (3). Lab. 5.**

Mastery of keyboard; techniques of machine operation; basic typewritten applications. For students with no previous training in typewriting. (Students with previous instruction or experience in typewriting should consult with Office Administration staff members for placement.)

201. Typewriting II* (3). Lab. 5. Pr., VED 200 with grade of C or one year of high school typewriting.

Emphasis on business letters, tabulation, reports.

202. Typewriting III* (3). Lab. 5. Pr., VED 201 with grade of C.

Advanced typewritten communications with special problems and arrangement.

203. Typewriting IV* (3). Lab. 5.

Statistical typewriting; composition at the typewriter; executive office projects.

210. Shorthand I* (5). Pr., VED 200 or equivalent.

Basic course in Gregg shorthand. Emphasis on recognition of principles; rapid reading of notes; dictation of new material.

211. Shorthand II* (5). Pr., VED 210 with grade of C.

Reinforcement of principles; speed building dictation; development of transcription skills.

212. Shorthand III* (5). Pr., VED 211 with grade of C.

Emphasis on dictation speed and mailable transcription.

246. Instructional Drawing (3). Lab. 6.

Preparing for the shop laboratory, including making freehand and pictorial sketches and drawings, reading working drawings, blue prints, manufacturers guides, and lettering, use of instruments, dimensioning, making models, floor plans, bills for materials, writing specifications, and developing working plans.

300. Transcription (5). Lec. 5, Lab. 5. Pr., VED 212 with grade of C.

Emphasis on improved production rates. Continued development of dictation speed. Transcription of letters with special features.

305. Records Management (3).

Basic procedures of filing, records storage and control. Practice in record keeping.

330. Careers in Rehabilitation Services (5).

History, legal basis, and fields of rehabilitation services. Exploration of specialty fields of mental retardation, mental illness, public offender, physically handicapped, speech therapy and hearing, visually handicapped, respiratory disease, alcoholic and aging.

*The shorthand and typewriting sequence should be begun at the highest possible level because credit may be gained through advanced placement. With previous training in either, the student may enter the second, third, or fourth quarter course. If a grade of C or higher is earned, credit is given for the lower courses. If a C is not earned, advanced placement credit will not be granted. Consult with OA staff for placement.

346. Vocational and Adult Education. Principles and Practices (3).

Principles of vocational education and their application in developing and operating preparatory and in-service programs.

400. Introduction to Power Mechanics (5). Lec. 2, Lab. 6.

Design and operational theories related to power machines. Internal combustion engines, power trains, hydraulic and cooling systems.

401. Practicum in Small Gasoline Engines (5). Lec. 2, Lab. 6.

Application of skills and abilities needed in teaching the maintenance and repair of small air cooled engines. Theories of compression, carburetion and ignition; laboratory exercises in repair and maintenance.

402. Automotive Construction and Repair (5). Lec. 2, Lab. 6.

Theories of design, principles of operation, and maintenance and repair of ignition system, fuel systems, power systems and chassis components.

403. Principles of Electricity (1). Lab. 3.

An introductory course in the principles and application of elementary laws governing electricity and its use.

404. Practicum in General Metals (5). Lec. 2, Lab. 6.

Application of skills and abilities needed in the teaching of metal processes applicable to vocational education program in the secondary school. Metal properties, power tools, heat treating, ornamental iron work, cold metal, sheet metal, machining metals; and arc and gas welding.

405. The School Shop (3).

Organization and management of the school shop; methods and materials integrated with the study of jobs and problems basic to the teaching of skills in vocational education.

406. Practicum in Building Construction and Maintenance (5). Lec. 2, Lab. 6.

Application of skills and abilities needed in teaching the erections of buildings and other related structures. Bills of materials; hand and machine woodworking; structural carpentry; plumbing; design and installation of residence wiring, heating and cooling concrete and masonry construction; painting and other related information. (A) Agricultural education majors and (B) Basic vocational education majors.

407. Practicum in Electricity (5). Lec. 2, Lab. 6.

Application of skills and abilities needed in the teaching of fundamental principles of electricity. Planning and developing projects involving an understanding of electrical principles as applied to materials selection, circuits, motors and devices; and maintenance and servicing of electrical equipment and appliances.

409. Teaching Electronics in Industrial Arts (5). Lec. 2, Lab. 6. Pr., consent of department head.

Theories and practices used in school electronic laboratories, projects designed and constructed.

411. Teaching Home Economics Education (5). Lec. 4, Lab. 2. Pr., admission to Teacher Education and FED 320 or equivalent.

Methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for Home Economics.

412. Programs in Home Economics Education (4). Lec. 3, Lab. 2. Pr., admission to Teacher Education and FED 320 or equivalent.

Principles of and experience in designing programs for home economics, evaluation of instruction and programs.

414. Program in Area of Specialization (3). Lec. 2, Lab. 2. Pr., admission to Teacher Education and FED 320 or equivalent.

Program planning principles involved in designing program activities for specific areas of specialization.

415. Teaching in Area of Specialization (3-5). Lec. 2, Lab. 2. Pr., admission to Teacher Education and FED 320 or equivalent.

Understanding of curriculum content; methods and techniques of instruction using appropriate instructional materials; planning and evaluation of instruction for specific area of specialization.

420. Office Machines (5). Lec. 5, Lab. 5. Pr., junior standing or consent of instructor and ability to type at a reasonable speed.

Designed to give a working knowledge of various machines found in modern offices. Basic training in use of dictating and transcribing, duplication, adding, calculating, and posting machines.

421. Office Apprenticeship (10). Lab. 20. Pr., VED 422, and senior standing. (Supervised work experience open to OA majors only).**422. Secretarial Procedures I (5). Pr., VED 300, and junior standing.**

Analysis of requirements of profession of executive secretary or administrative assistant. Stressed are personal factors, decision-making abilities, legal duties, supervisory duties, new developments of technology and effect on field, and employment opportunities. Simulated office situations. Case studies.

423. Secretarial Procedures II (5). Pr., VED 300, and junior standing.

Major activity: The work of several long-term projects in which students benefit from long-range planning, setting of priorities, expediting of solutions to problem situations, and handling volume correspondence.

424. Administrative Management (5). Pr., consent of instructor.

Management of information in many forms, systems design, data collection and processing methods, communications and records management, office physical facilities, office performance standards and control, and motivation of personnel.

- 457. Practicum in Graphic Arts Instruction (3). Lab. 6. Pr., junior standing.**
To prepare pre-service and in-service vocational teachers to teach graphic arts skills in printing and duplicating techniques, advertising display, and other modes of graphic communication.
- 462. Directed Work Experience in Distributive Education (5). Lab. 10. Pr., VED 414.**
In-service, supervised work experience. Individually designed for part-time and/or summer experience.
- 466. Teaching Out-of-School Groups (3). Pr., VED 414.**
Conducting surveys, occupational analysis, using advisory committees, organizing, conducting and supervising various types of adult education.
- 475-476-477-478-479-480. Trade and Technical Experience (5-5-5-5-5-5).**
An experience completed by supervised employment or by examination on basis of journeyman level work experience at the maximum rate of 15 quarter hours for each year of such experience. In those occupations where there is no organized apprenticeship experience beyond the level of learner, the level of learner will correspond to starting the curriculum, elective coursework may be substituted for these credits.

ADVANCED UNDERGRADUATE AND GRADUATE

- 508. Teaching Mechanical Technology (5).**
Objectives and methods; equipment and management of vocational education shops; organization of projects; recent developments in specialized areas of mechanics; in-service teaching problems. Student plans for demonstration of methods for teaching mechanical skills.
- 510. Occupational Information (3). Lec. 2, Lab. 2. Pr., FED 320 or equivalent.**
Occupational structure, job qualifications and requirements, sources of occupational information, current trends, industrial and occupational surveys. Preparation, evaluation, and dissemination of occupational information used by teachers in vocational and technical schools.
- 513. Nature of Adult Education (5).**
The characteristics of adults as learners and the history, philosophy, and nature of adult education; applied to specific adult groups in developing and implementing adult educational programs in basic, occupational or continuing education. History and principles of adult education as applied to the development and implementation of programs in remedial, occupational and continuing education.
- 530. Evaluation and Training in Vocational Rehabilitation (4) Lec. 3 hours daily for 6 weeks, internship 4 weeks. Pr., consent of department head.**
Purposes, principles and techniques of client evaluation and training; including personal, social and physical adjustment, vocational choice and selected techniques used in the evaluation and training process.
- 531. Research in Evaluation and Training in Vocational Rehabilitation (4). Lec. 3 hours daily for 6 weeks, internship 4 weeks. Pr., consent of department head.**
Study of a problem using research techniques, to be selected in consultation with the supervising professor.
- 535. Introduction To Vocational Evaluation (5).**
History, philosophy, theoretical bases, and present status of vocational evaluation. Survey of the vocational evaluation process, principles, techniques, and procedures. Innovative methodology and future trends in vocational evaluation are explored.
- 536. Systems of Vocational Evaluation (3). Lec. 1, Lab. 4. Pr., VED 535.**
Instruction and supervised practice in the application of the GATB, the J.E.V.S. system, the TOWER system, the Val-Par system, the Singer-Graflex system and related techniques of vocational evaluation.
- 537. Vocational Training and Occupational Orientation of the Mentally Retarded (5).**
Principles for providing occupational orientation and work experience, techniques of curriculum planning, job classification and evaluation, selection, and placement, curricular activities related to work experience, community agencies and public relations.
- 541. Development of Vocational Education (4).**
Historical perspective of the development of vocational education with an overview of its nature and purpose relative to the technological society.
- 550. Career Education (4).**
Introduction career education as a system concept encompassing the entire educational experience in K-14. Emphasis will be given to the interrelated nature of the role of the administrator, the counselor, and the classroom teacher in career education.
- 552. Instructional Programs in the Construction Industry (4). Lec. 2, Lab. 4. Pr., VED 414 or graduate standing.**
- 554. Instructional Programs in the Manufacturing Industry (4). Lec. 2, Lab. 4. Pr., VED 414 or 415 or graduate standing.**
- 556. Learning Resources in Area of Specialization (4). Pr., FED 320 or equivalent.**
- 558. Coordination and Supervision of Vocational Education Program in an Area of Specialization (5). Lec. 4, Lab. 2.**
Develops and maintains appropriate relationship between the school and on-the-job program; records of coordination; student placement, improving employable skills and habits; recruitment and selection of work experience applicants; work experience rotation; public information and other similar activities.

569. Community Programs in Adult Education (5). Lec. 4, Lab. 2. Pr., VED 413 or consent of instructor.

A comprehensive, field centered investigation of Adult Education programs conducted by various organizations, agencies, and groups. Emphasis will be placed upon the curriculum and instructional aspects of the several programs.

574. Organization of Instruction in Vocational-Technical Education (5).

Trade and occupational analysis; principles and procedures of identifying and selecting the skills and knowledge needed in the preparation of courses of instruction. Principles and procedures for individualizing instruction.

591. Problems in Teaching the Disadvantaged Adult (3-5).

The disadvantaged adult with special emphasis on the unique sociological, psychological and physiological factors that influence learning and participation in remedial learning activities.

GRADUATE

602. Teacher Education in Vocational and Adult Education (5).

Designed for supervisors of student teachers, teacher educators, and other graduate students. Major emphasis deal with administration of vocational education programs, research, problems which supervising teachers encounter in the student teaching program.

603. Problems in Agricultural Occupations (5).

Securing, organizing and interpreting information for guidance and teaching purposes; curriculum development, developing instruction units and planning teaching activities for on-farm and off-farm occupations.

606. Organization and Utilization of Community Resources (5).

Processes through which new ideas and innovations are utilized through community organization to maximize the effective use of physical and human resources.

608. Administration of Vocational and Practical Arts Education (5).

Prepares professional personnel for leadership positions and to relate current social demands to vocationally oriented programs. Content includes philosophy and an application of procedures in administering and supervising new and on-going programs to meet changing socio-economic conditions.

630. Diagnostic Vocational Evaluation (4). Pr., PG 415 or equivalent.

Process, principles, and techniques used to diagnose general assets and liabilities of the individual. Includes the functional and analysis of biographical data and the use of the evaluation interview. Emphasis is placed upon the rationale underlying the selection and use of psychometric tests in vocational evaluation.

631. Prognostic Vocational Evaluation (4). Pr., VED 630 or consent of department head.

Process, principles, and techniques used to determine and predict work behavior and vocational potential. Includes the rationale underlying the selection and use of occupational exploration programs, work samples, situational tasks, simulated work experiences, and job tryouts in vocational evaluation.

632. Use and Interpretation of Vocational Evaluation Data (4). Pr., VED 630 and 631 or consent of instructor.

Process, principles, and techniques used in the interpretation of vocational evaluation data to clients, to rehabilitation personnel, and to facility staff. Focuses upon the interpretation of data through the formal staff conference, vocational counseling, report writing, and follow-up.

634. Work Sample Development (5). Pr., consent of instructor.

Theoretical and technical principles related to the development, standardization, and validation of work samples. Supervised experience in the application of work sample development principles.

650. Seminar in Areas of Specialization (1-3), may be repeated for credit not to exceed 10 hours.

Advanced graduate students and professors pursue cooperatively selected concepts and theoretical formulations.

Electrical Engineering (EE)

Professors Honnell, C. Carroll, Graf, Haeussermann,

Lowry, Phillips, and Russell

Associate Professors Irwin, Head, Barnes, Boland, B. Carroll, Feaster, Gross, Nagle,

Rogers, and Slagh

Assistant Professors Cook, James, Kane, Kerns, Pinson, and Shumpert

Instructor Youngblood

Adjunct Professor Heath

201. Introduction to Electrical Engineering (3). Pr., sophomore standing.

The electrical engineer and his contribution to society; the digital computer as an electrical engineering tool; programming solutions to electrical engineering problems.

- 202. Timesharing and Terminal Systems (2).**
Time-shared computer systems, remote terminals, terminal languages, and system applications.
- 261. Linear Circuit Analysis I (3). Coreq., PS 222, MH 265.**
Basic laws and concepts; resistive circuits, linear algebra, R-L and R-C circuits.
- 263. Linear Circuit Analysis II (4). Pr., EE 261. Coreq., EE 264 for EE students.**
Sinusoidal forcing functions and phasors; steady-state response, average power and RMS values, polyphase circuits, Fourier analysis, and magnetically coupled circuits.
- 264. Linear Circuit Analysis II Laboratory (1). Lab. (3). Coreq., EE 263.**
Experiments in electrical circuits.
- 300. Fundamentals of Electrical Engineering (5). Coreq., MH 265, PS 222.**
An introduction to the fundamental concepts of electrical engineering with emphasis on topics in circuits, electronics, and energy conversion. (Not open to Electrical Engineering majors.)
- 301. Engineering Instrumentation (3). Lec. 2, Lab. 3. Pr., EE 263.**
Principles of instrumentation. The detection and measurement of physical quantities with emphasis on transducers, signal processing, and display.
- 322. Combinational Logic Circuits (3).**
Boolean algebra and special forms of Boolean expressions; logic, logic elements, and logical design; number systems, introduction to codes and computer elements.
- 324. Sequential Logic Circuits (3). Pr., EE 322.**
Models of sequential systems; completely and incompletely specified sequential circuits; Mealy-Moore transformation; introduction to asynchronous machines.
- 351. Linear Feedback Systems (5). Lec. 4, Lab. 3. Pr., EE 362.**
Transfer functions, transient and steady state performance, stability, design and compensation of feedback control systems.
- 352. Nonlinear and Sampled-Data Systems Analysis (3). Pr., EE 351.**
Describing functions; phase plane analysis; sampled-data systems; use of state space concepts.
- 362. Linear Systems (6). Lec. 5, Lab. 3. Pr., MH 266, EE 263, 264.**
Fourier Series, Fourier transforms, Laplace transforms, state space analysis.
- 371. Electronics I (3). Pr., EE 263 or 300.**
Semiconductors, principles of electronic devices, design of low frequency electronic circuits.
- 374. Electronics II (4). Pr., EE 371, EE 351.**
Integrated circuits, high frequency limitations of electronic devices, frequency response, feedback, design of high frequency and feedback electronic circuits.
- 382. Electromechanical Energy Conversion I (3). Pr., EE 263 or 300**
Basic concepts in electromechanical energy conversion. Linear and nonlinear analysis of transformers and dc machines.
- 384. Electromechanical Energy Conversion I Laboratory (1). Lab. 3. Coreq., EE 382.**
Experiments involving electromechanical energy conversion devices.
- 391. Electromagnetics I (4). Pr., PS 222.**
Scalar and vector fields, the electrostatic field, the magnetostatic field, Maxwell's equations, boundary conditions.
- 392. Electromagnetics II (3). Pr., EE 391.**
Energy and power relations for the electromagnetic field, time varying fields, plane waves, theory and application of guided waves.
- 397. Introduction to Acoustics and Noise Control (3). Pr., MH 265 or consent of instructor.**
Acoustical terminology and units, acoustic wave equation, propagation of sound waves, psychoacoustics, microphone and loud speakers, basic sound measurements and analysis, noise control.
- 412. Electrical Properties of Materials (3). Pr., EE 392, PS 320.**
Studies of the electrical properties of materials with emphasis on semiconductors.
- 413. Physical Electronics (3). Pr., EE 412.**
Physical properties of electrical and electronic devices.
- 422. Digital Subsystems (3). Pr., EE 324.**
Decoders, shift registers, adders, accumulators, one shots, counters, read-only memories, microprocessors, and their applications.
- 425. Minicomputer Organization (4). Pr., EE 322.**
Hardware and software components of computer systems; hardware organization, memory, control, processing units, instruction set, address modes, instruction cycle, I/O; assembly language programming, subroutine, macros, data representation; hardware design.
- 429. Computer Projects Laboratory (TBA). Pr., consent of instructor.**
Selected students propose, construct, and demonstrate special purpose digital hardware devices using state-of-the-art logic modules and general-purpose control computers and peripherals.
- 441. Communication Theory (5). Lec. 4, Lab. 3. Pr., EE 475, IE 311.**
Spectral analysis. Amplitude, angle and pulse modulation, and demodulation techniques.

- 475. Electronics III (5). Lec. 4, Lab. 3. Pr., EE 374, EE 322.**
Oscillators, IC operational amplifiers, linear analog systems, nonlinear analog systems, IC logic families, power circuits.
- 482. Electromechanical Energy Conversion II (3). Lec. 3. Pr., EE 382.**
Linear and nonlinear analysis of synchronous and induction machines. Operation in the generator and motor modes. Solid state control.
- 483. Power System Analysis I (3). Coreq., EE 482.**
Basic power system terminology. Synchronous machine, transmission line, and transformer system models. Symmetrical fault and load flow analysis.
- 484. Electromechanical Energy Conversion II Laboratory (1). Lab. 3. Pr., EE 384, coreq. EE 482.**
Experiments involving electromechanical energy conversion devices.
- 490. Special Topics. Credit to be arranged. Pr., consent of instructor. May be taken more than one quarter.**
- 492. Electromagnetics III (4). Lec. 3, Lab. 3. Pr., EE 392.**
Continuation of guided waves; introduction to radiating systems; coordinated laboratory demonstrations and experiments.
- 499. Special Projects. Credit to be arranged. Pr., consent of instructor. May be taken more than one quarter.**

ADVANCED UNDERGRADUATE AND GRADUATE

- 520. Fundamentals of Computer Graphics Systems (4). Lec. 3, Lab. 3. Pr., EE 324, 425, IE 300 or the equivalent, consent of the instructor.**
Hardware and software components of computer graphics systems; display files, two-dimensional and three-dimensional transformations, clipping and windowing, perspective, hidden-line elimination and shading; interactive graphics; survey of applications.
- 521. Introduction to Artificial Intelligence and Robotics (4). Lec. 3, Lab. 3. Pr., EE 526 or 527.**
Software and hardware pertaining to the design of intelligent computer systems. Problem representation, game playing. State space search techniques, problem reduction search techniques, Mini Maxing-Alpha Beta Pruning; sensors, transducers optics; automatic controllers, numeric controller machines, industrial and research robots.
- 522. Digital Subsystems (4). Lec. 3, Lab. 3. Pr., EE 324.**
Decoders, shift registers, adders, accumulators, one-shots, counters, read only memories, random access memory, programmed logic arrays, logic families, and their applications.
- 523. Fault Diagnosis of Digital Systems (3). Coreq., EE 324.**
Fault testing for combinational and sequential logic circuits, fault models, test generation, diagnosis of logic systems, implications in design.
- 524. Microcomputers (4). Lec. 3, Lab. 3. Pr., EE 425.**
Microcomputer chip sets, microcomputer system design, machine programming, PROM programming, interfacing, applications.
- 526. Minicomputer Laboratory (1). Lab. 3. Pr., EE 201 or equivalent, coreq. EE 425.**
Students learn to program and operate a typical minicomputer system. Programming is done in MACRO assembly, in BASIC and in APL in the time sharing mode. FORTRAN—assembly language linkage techniques and peripheral driver routines.
- 527. Systems Programming and Operating Systems (3). Pr., EE 425, IE 485.**
An introduction to assembly languages, assemblers, macro processors, loaders, higher level languages, and operating systems.
- 528. Compiler Construction (3). Pr., EE 427.**
Review of language structures, system programs, and storage allocation. Compilation of statements and expressions. Compiler organization, symbol tables, scanning, object code generation, diagnostics, code optimization, compiler writing languages, and bootstrapping.
- 543. Communication Systems (3). Pr., EE 475.**
Impedance matching, filtering, transmitters and receivers, telemetry, radar, image transmission, lasers.
- 547. Introduction to Digital Signal Processing (5).**
Introduction to digital filters, the discrete Fourier Transform, and their applications in signal processing.
- 549. Electrical Methods in Biomedical Engineering (3). Pr. EE 362 or consent of instructor.**
Basic electrophysiology, models of synaptic and axonal nerve transmission, action potentials, neuronal specificity, electrical engineering methods, laboratory demonstrations.
- 551. Hybrid Computation (5). Lec. 4, Lab. 3. Pr., EE 352.**
Analog computer simulation of physical systems; logic control of analog computers; digital computer simulation of physical systems; hybrid computation; use of the computer as a design tool.
- 553. AC Carrier Control Systems (3). Lec. 2, Lab 3. Pr., EE 351, EE 482.**
Modulation theory; AC carrier control system components; analysis and design of AC carrier control systems.

- 564. Introductory Network Synthesis (3). Pr., EE 362.**
Introduction to the synthesis of passive networks, with emphasis on driving point functions.
- 565. Advanced Circuit Analysis (3). Pr., EE 362.**
- 574. Electronic Systems (3). Lec. 2, Lab. 3. Pr., EE 475.**
Special topics in contemporary electronics.
- 585. Power System Analysis II (3). Pr., EE 483 or consent of instructor.**
Symmetrical components and analysis of unbalanced faults on power systems. Relay and protection schemes.
- 586. Direct Energy Conversion (3). Pr., EE 382, EE 391, ME 301, or consent of instructor.**
Fundamentals and energy consideration, thermoelectric devices, photovoltaic devices, thermionic devices, magnetohydrodynamic power generation, batteries and fuel cells. Ecological consideration.
- 587. Matrix Analysis of Electrical Machines (3). Pr., EE 482.**
Matrix algebra; linear transformations, symmetrical components, the generalized machine; direct current machines; induction machines; synchronous machines.
- 588. Power System Reliability (3). Pr. MH 266, EE 483, or consent of instructor.**
Reliability techniques applied to the planning and design of generation, transmission, and distribution facilities of electrical power systems.
- 594. Electromagnetic Propagation (3). Pr., EE 492.**
Principles of wave propagation in communication systems. Study of propagation modes. Introduction to interaction of electromagnetic waves and plasmas.
- 595. Microwaves (3). Pr., EE 492.**
Analysis of distributed systems including waveguides and transmission lines, generation and detection of microwave energy, coordinated laboratory experiments and demonstrations.
- 596. Antennas (3). Pr., EE 492.**
Analysis of radiating systems, to include individual radiators and antenna arrays, impedances in radiating system design, antenna performance measurement techniques, coordinated laboratory experiments and demonstrations.

GRADUATE

- 601. Linear Analysis (5).**
Methods of analysis, the exponential forcing function, Fourier series, Fourier transform, Laplace transform, and superposition integrals. Complex variables and contour integration.
- 610. Advanced Topics in Electrical Power Systems (5). Pr., EE 585, or consent of instructor.**
Power system transients, economic dispatch, Optimum operation of power systems, HVDC, the governor-exciter-generator system.
- 612. Advanced Topics in Electromechanical Energy Conversion (5). Pr., consent of instructor.**
Dynamic equations of motion of electromechanical systems; the generalized rotating electromechanical energy converter; dynamics of systems; the n - m symmetrical machine.
- 620. Nondeterministic Systems Analysis (3). Pr., consent of instructor.**
Applications of probability, random variables, and stochastic processes in Electrical Engineering.
- 621. Switching Theory I (4). Pr., EE 324 or equivalent.**
Special topics in switching theory and digital design. Multiple level circuits, decomposition, threshold and multiple-valued logic, linear sequential circuits, and issues in asynchronous sequential circuit design.
- 622. Switching Theory II (4). Pr., EE 621 or equivalent.**
Algebraic structure of sequential machines; modular logic design, universal logic modules, array realizations, programmable logic arrays, physical circuit design, partitioning, placement, routing; magnetic bubble logic; fault diagnosis; fault-tolerant design.
- 623. Coding Theory (3). Pr., EE 322.**
Error detection and correction, linear codes, cyclic codes, BCH codes, coding bounds, shift register sequences, and coding systems.
- 626. Digital Computer Architecture I (3). Pr., EE 425, or equivalent.**
Structures for the central digital computer are studied; arithmetic units, machine language features, information transfer, memory hierarchy, channels.
- 627. Digital Computer Architecture II (3). Pr., EE 626.**
Parallelism in hardware and software. High speed processors, multiple machines, multiprogramming, and multiprocessing.
- 628. Digital Computer Projects Laboratory (TBA). Pr., consent of instructor.**
Selected students design and breadboard a simple stored-program computer, the design includes hardware implementations of CPU, memory, I/O, and control unit; an assembly language and translator to machine code is also completed.

- 640. Digital Computing Systems (3). Pr., EE 626.**
Present and next generation digital computers; minicomputers, multiprocessors, business and scientific oriented models; diverse uses of digital computers today, future trends and applications for digital computers.
- 641. Linear Noise Theory (5). Pr., EE 620 or consent of instructor.**
Probability, noise processes, correlation, power spectra, noise through linear systems, matched filters, Wiener filters, prewhitening, parameter optimization.
- 642. Fault Tolerant Computing (3). Pr., EE 523 or equivalent.**
Architecture and design of fault tolerant computer systems using protective redundancy, estimation of the reliability and availability of fault tolerant systems, error recovery, and fault diagnosis.
- 643. Computer Software Development (3). Pr., EE 527, or equivalent.**
Programming systems and languages, interactive systems, philosophy of operating systems, program-program interfaces, problems in data management, software maintenance and reliability.
- 644. Theory of Compilers (3). Pr., EE 528, or equivalent.**
Formal properties of grammars, syntactic analysis, lexical analysis, analytical modeling, macro generators, code selection, hard-wired compilers, and extensible languages are typical topics studied.
- 645. Detection, Estimation and Modulation Theory (5). Pr., EE 641 or consent of instructor.**
Hypothesis testing, parameters in Gaussian noise, estimation of continuous waveforms, linear estimation.
- 650-651-652. Electromagnetic Theory and Applications I-II-III (5-5-5). Pr., consent of instructor.**
A three-course sequence for students specializing in electromagnetics.
- 653. Antennas (5). Pr., consent of instructor.**
Advanced treatment of radiating systems.
- 656. Network Synthesis (5). Pr., EE 601.**
Two-terminal passive networks; properties, realizability, and principles of synthesis. Conventional and modern filter synthesis.
- 658. Advanced Acoustics and Noise Control (3). Pr., consent of instructor.**
Acoustic wave equation and propagation of sound waves; acoustical transducers; instrumentation; room acoustics; psychoacoustics; special topics in noise control.
- 670. Information Theory (3). Pr., consent of instructor.**
Signal descriptions; spectral representation; random variables and processes; information measures; channel models; coding theorems.
- 673-674. Communication Electronics I-II (3-3). Pr., consent of instructor.**
RF circuitry; impedance matching networks; oscillators; mixers; modulators; detectors; RF amplifiers; high frequency devices; integrated subsystems; testing and measuring techniques in RF systems.
- 675-676. Analog Electronic Circuits I-II (3-3). Pr., consent of instructor.**
Analysis, design, and application of discrete and integrated electronic devices in analog circuitry. Amplifiers, active filters; integrators; multipliers; dividers; logarithmic converters. Speed capability and noise considerations.
- 677-678. Electronic Switching Circuits I-II (3-3). Pr., consent of instructor.**
Analysis, design, and application of discrete and integrated electronic devices in switching circuitry. Wave shaping; integrated circuit logic families; gating; wave generation; counting; timing; memory.
- 679. Advanced Solid State Electronics (3). Pr., consent of instructor.**
Theory of solid state devices. Theory and operation of new electronic devices.
- 680. Directed Reading in Electrical Engineering. Credit to be arranged.**
- 681-682-683. Automatic Control Theory I-II-III (5-3-3). Pr., consent of instructor.**
Advanced analysis and design of control systems, including modern and classical control theory as applied to linear, nonlinear, continuous, and discrete systems.
- 690. Special Topics. Credit to be arranged. Pr., consent of instructor. May be taken more than one quarter.**
- 691-692-693. Advanced Automatic Control Theory I-II-III (3-3-3). Pr., consent of instructor.**
Optimal control theory for deterministic and non-deterministic systems; optimal linear filter theory; modern stability theory.
- 695. Seminar. Credit to be arranged. Pr., consent of instructor. May be taken more than one quarter. Pr.,**
- 698. Special Projects. Credit to be arranged. Pr., consent of instructor. May be taken more than one quarter.**

699. **Research and Thesis. Credit to be arranged. May be taken more than one quarter.**
799. **Research and Dissertation. Credit to be arranged. May be taken more than one quarter.**

Engineering (EGR)

For other engineering courses, refer to individual departmental course offerings.

100. **Engineering Perspectives (2). Lec. 1, Lab. 2. Pr., PN student, or consent of instructor.**

An introduction to the engineering profession; its scope, activities, opportunities, and relationship to society in general.

491. **Legal Aspects of Engineering, Architecture and Design (3).**

Legal aspects of engineering and design; an introduction to the American legal system with emphasis on problems of the engineering and design professions.

English (EH)

Professors Patrick, *Head*, W. S. Allen, Amacher, Breyer, N. A. Brittin, Current-Garcia, Jones, Littleton, Nist, and Woodall

Associate Professors Hudson, Morrow, Mowat, Rose, T. Wright

Assistant Professors R. Brittin, Daron*, Denton, Dry, Gresham, Hayes*, Hitchcock, Jeffrey, Kouidis*, Latimer, Pearson*, Rygiel, Solomon, and Stroud

Instructors Brown*, Dunlop, Fresch, Gwin*, Hey*, Hopkins*, Milnor, Oliver*, Rankin*, Ritchey*, Rivers, Switzler, Swofford*, Tubbs*, B. Wade, J. Waters*, M. Waters*, Whatley, Williams, and R. Wright

The requirements for English and Comparative Literature majors enrolled in the School of Arts and Sciences are stated on pages 82-83; requirements for English and Comparative Literature majors enrolled in the School of Education are stated on page 119.

English Composition (101-102-103 or 105-106) is required of all students and is a prerequisite for all other courses in English.

I. General Curriculum Courses

100. **Basic English (No credit). All quarters.**

English grammar and mechanics and fundamentals of composition. Students placed in this course by the English Department must pass EH 100 to be admitted to EH 101-102-103.

- 101-102-103. **English Composition (3-3-3). EH 101 pr. for EH 102; EH 102 pr. for EH 103. All quarters.**

The essentials of composition and rhetoric. Reading of selected essays, fiction, poems, and plays.

- 105-106. **Honors Freshman English (3-3). EH 105 pr. for EH 106. EH 105, Fall; EH 106, Winter.**

Reading and composition for superior students. Students earning a C or better final grade in both courses will receive an additional three hours of credit. The student who fails to earn at least a C changes to the regular sequence (EH 101-102-103) and completes a total of three courses. Departmental approval required for admission to this sequence.)

141. **Medical Vocabulary (3). Fall, Winter, Spring.**

Prefixes, suffixes, and the more common root words of medical terminology.

- 250-251. **Survey of English Literature for Superior Students (5-5). EH 250 pr. for EH 251. All quarters.**

English literature from *Beowulf* to the present. An optional alternative to EH 253-254-255 for students with a B or better average in Freshman English.

- 253-254-255. **Survey of English Literature (3-3-3). EH 253 pr. for 254; EH 253-254 pr. for EH 255. All quarters.**

English literature from *Beowulf* to the present.

- 260-261-262. **Survey of Literature of the Western World (3-3-3). All quarters.**

Master works from Homer to Faulkner: EH 260, the Classical Period; EH 261, medieval through eighteenth century; EH 262, nineteenth and twentieth centuries.

*Temporary appointment

II. English Literature Before 1700.**361. History of English Drama (5). Winter.**

English drama from the medieval period to 1900.

362. Poetry and Prose of the English Renaissance (5). Fall.

Nondramatic literature, 1475-1640.

405. Chaucer (5). Winter.

The major works of Chaucer in Middle English.

406. Medieval English Literature (5). Spring.

This course concentrates on *Le Morte Darthur*, *Sir Gawain and the Green Knight*, *Pearl*, medieval drama, and the Middle English lyric.

465. The Age of Milton (5). Spring.

Nondramatic literature of the seventeenth century, with emphasis on Milton.

498-499. Readings for Honors (5-5).^{*} Pr., junior standing with a minimum of 2.0 overall average, a 2.5 average in at least five upper division English courses, and the consent of the English Department.

Individual reading programs in a specific period or phase of literature or language, as determined by the instructor and student. An honors essay and a written examination will be required.

ADVANCED UNDERGRADUATE AND GRADUATE**551-552. Shakespeare (5-5). EH 551-552, Fall; EH 551, Winter; EH 552, Spring.**

Credit for either or both of these courses precludes credit for EH 350. The first quarter deals with the plays written before 1600, emphasizing comedies and histories; the second, with the plays written after 1600, stressing tragedies.

III. English Literature After 1700.**352. Contemporary Fiction (5). Fall.**

American and British novelists from Lawrence to Faulkner.

363. Eighteenth Century British Literature (5). Winter.

The Age of Dryden, Pope, and Swift.

375. The English Romantic Movement (5). Spring.

Romantic poetry from Gray to Keats.

463. Eighteenth Century English Literature (5). Spring.

Poetry and prose from Johnson through Blake.

ADVANCED UNDERGRADUATE AND GRADUATE**550. Contemporary Poetry (5). Winter.**

The chief modern poets of England and America.

557. Victorian Literature (5). Winter.

The major poets and nonfiction writers from 1830 to 1890.

581-582. English Novel (5-5). EH 581, Fall; EH 582, Winter.

The first course emphasizes the eighteenth century novel; the second, the nineteenth century novel.

IV. American Literature**325. The Short Story (5). Winter, Summer.**

The development of the short story in America and Europe from the early nineteenth century to the present.

357-358. Survey of American Literature (5-5). EH 357, Fall, Spring; EH 358, Winter, Summer.

The first course deals with American literature from the beginning to 1860; the second, with American literature from 1860 to the present.

472. The American Novel (5). Fall.

The development of the American novel from the beginning to 1900.

ADVANCED UNDERGRADUATE AND GRADUATE**591. American Poetry (5). Fall, alternate years.**

Major American poets from the Colonial period to the present.

592. American Drama (5). Fall, alternate years.

American dramatic and stage history from Colonial times to the twentieth century, with emphasis on developing tastes and techniques.

^{*}May be taken in Categories II-VII.

595. Southern Literature (5). Not open to students with credit in EH 365. Spring.

The poetry, fiction, and nonfiction prose writings in the South from Revolutionary times to the present, with major emphasis centering on Southern regional attitudes and trends.

V. Literature in Translation**312. The European Novel (5). Spring.**

The reading and analysis of significant novels by major European writers.

340. The Classical Background (5). Fall.

Readings from the major Greek and Roman writers. The texts studied are chosen with particular attention to their subsequent influence upon English and American literature.

353. Contemporary Drama (5). Spring.

Continental, British, and American dramatists from Ibsen to the present day.

ADVANCED UNDERGRADUATE AND GRADUATE**571. Renaissance and Baroque (5). Fall.**

A survey of the major trends in European literature from the fourteenth to the seventeenth centuries.

573. Romanticism (5). Spring, alternate years.

A comparative study of the major authors of the Romantic movement in Europe. The course's aim will be to distinguish national peculiarities and determine possibilities of a common thematic, stylistic ground.

574. Realism to Naturalism (5). Spring, alternate years.

A comparative study of major French, German, and Russian authors of Realism and Naturalism with a view to evolving novelistic techniques, subject matter, and philosophy.

575. The Symbolist Movement in Literature (5). Winter.

A comparative study of Symbolism of the late nineteenth and early twentieth centuries.

VI. Language and Linguistics**391. Rhetoric and Stylistics (5). Spring.**

The principles of rhetorical analysis and of modern stylistics with practical application of those principles to varied types of literary materials.

393. Introduction to the Study of the English Language (5). All quarters.

A brief history of English, together with a survey of traditional as well as modern approaches to the language (including both structural and transformational grammars). The focus is on the systems of English, but the course also treats semantics, usage, dialectology, lexicography, and psycholinguistics.

ADVANCED UNDERGRADUATE AND GRADUATE**541. History of the English Language (5). Spring.**

The chronological development of the English language.

594. Introduction to Linguistics (5). Winter.

Modern methods of language study, with particular emphasis on English syntax and semantics.

VII. Writing Courses.**301. Creative Writing (3). Fall, Spring.**

The writing and criticizing of short stories. But the student may, on special consent of the instructor, be permitted to write poetry, drama, or any other form of imaginative literature.

302. Creative Writing (3). Fall, Spring.

A continuation of English 301.

304. Technical Writing (3). All quarters. Not open to students with credit in EH 315.

Practical writing, especially correspondence and reports, for students in scientific and technical fields.

315. Business and Professional Report Writing (3). All quarters.

The writing of formal and informal business reports with emphasis on design, organization, research, and presentation.

390. Advanced Composition (5). All quarters.

The practice and theory of expository writing; the command of language for the clear and forceful communication of ideas.

415. Written Business Communications (3). All quarters.

Application of semantics, communication theory, human relations, and rhetorical techniques to written business communications; practice in expository and persuasive writing.

ADVANCED UNDERGRADUATE AND GRADUATE**530. The Craft of Fiction (5). Pr., EH 301-302, consent of instructor. Winter.**

The writing of fiction.

VIII. Courses on Special Topics.

310. **Word Study (3). Fall.**
Both practical study of words to increase reading vocabulary and study of semantics (historical, literary, linguistic, general) to develop an analytical awareness of words and their uses.
350. **Shakespeare's Greatest Plays (3). Not open to students with credit in EH 551-552. Winter.**
Some of Shakespeare's masterpieces.
365. **Southern Literature (3). Spring.**
380. **The Image of the Businessman in American Literature (3). All quarters.**
The image of the businessman in selected works by American authors from the Colonial period to the present.
383. **Women in English and American Literature (3). Winter.**
Alternately, this course studies the stereotypes of women in literature and the achievement of women writers.
384. **The American Dream (3). Spring.**
The concept and sources of the American Dream and its influence on American literature from the discovery of America to the present.

GRADUATE

610. **Introduction to Graduate Study (5). Fall.**
- 611-612. **Studies in the History and Interpretation of Literature (5-5). Summers only.**
614. **The Theory of Prose Fiction (5). Spring.**
Methods and techniques of prose fiction, particularly as they developed during the late nineteenth and early twentieth centuries. The course will focus on the close study of selected novels and criticism.
- 616-617. **Studies in the American Language (5-5). Summers only.**
620. **The English Language I: Old English (5). Fall.**
621. **The English Language II: Middle and Modern English to 1500 (5). Pr., EH 620. Winter.**
623. **Beowulf (5). Pr., EH 620. Winter.**
625. **Medieval Literature (5). Fall.**
626. **Chaucer (5). Spring.**
627. **Linguistics I: Phonology and Morphology (5). Fall.**
628. **Linguistics II: Syntax and Grammar (5). Winter.**
629. **Linguistics III: Formal Stylistics (5). Spring.**
631. **Elizabethan and Jacobean Drama (5). Fall.**
632. **Spenser (5). Spring, 1976. Alternates in Spring with EH 636.**
633. **Studies in the Poetry and Prose of the English Renaissance (5). Alternates in Winter with EH 634.**
634. **Poetry and Prose of the Seventeenth Century (5). Alternates in Winter with EH 633.**
635. **Studies in Shakespeare (5). Spring.**
636. **Milton (5). Alternates in Spring with EH 632.**
640. **Restoration and Eighteenth Century English Drama (5). Spring.**
641. **Studies in the Age of Pope (5). Fall.**
642. **Studies in the Age of Johnson (5). Winter.**
650. **Studies in English Romanticism (5). Winter.**
652. **Victorian Poetry (5). Spring.**
653. **Victorian Prose (5). Fall.**
654. **Studies in the Nineteenth Century English Novel (5). Spring.**
660. **Modern Poetry (5). Spring.**
661. **Modern Fiction (5). Winter.**
662. **Studies in Twentieth Century Literature (5). Fall.**
670. **American Literature of the Colonial and Revolutionary Periods (5). Spring.**
671. **Studies in American Literature, 1800-1860 (5). Alternates in Summers and Winters with EH 673.**
672. **Studies in American Literature, 1860-1914 (5). Fall.**

- 673. **Studies in the Literature of the South (5).** Alternates in Summers and Winters with EH 671.
- 680. **The History of Literary Criticism (5).** Alternates in Summers and Winters with EH 681.
- 681. **The History of Literary Criticism (5).** Continuation of EH 680. Alternates in Summers and Winters with EH 680.
- 684-685. **Directed Individual Study (5-5).**
- 699. **Research and Thesis.**
- 799. **Research and Dissertation.**

Environmental Health (ENH)

For information on this program refer to the description of the curriculum in the Interdepartmental curricula section of the Bulletin.

Family and Child Development (FCD)

Professor Hodson

Associate Professors M. Layfield, B. Lindholm, and Toulaitos, *Head*,

Assistant Professors Christenson, Current-Garcia, Hanna,

Hatch, Hinton, and Scarth

Instructors Byron, Meadows, and Styers

Adjunct Associate Professor Chase

Adjunct Associate Professor Crouch

- 157. **Family and Human Development (3). All quarters.**
Human development as it is affected by the family and the family as it affects and is affected by the culture. Prior credit for any other Family and Child Development course precludes credit for this course.
- 204. **Dynamics of Marriage (3). Fall, Winter.**
Male and female roles in mate choice, marriage, adjustment, parenthood and marriage problems. Open to men and women.
- 267. **Child Development I: Principles and Theories (4). Pr., SY 201. All quarters.**
Introduction to the principles and theories of child development.
- 268. **Family I: Structure and Function of the Family (5). Pr., SY 201. All quarters.**
Introduction to the structure and function of the family, its interaction with other societal institutions, and the effects on all family members.
- 300. **Approaches to Child Study (5). Lec. 4, Lab. 2. Pr., FCD 267, 268. Fall, Spring.**
Principles and techniques of studying children and their families. Directed observation experiences are arranged in the Child Study Center.
- 301. **Child Development II: Infancy and Preschool Age (4). Pr., FCD 267, 268. Fall, Winter, Spring.**
Physical, intellectual, and social development of children from infancy through preschool age, emphasizing familial influences on development and behavior. Laboratory experiences may be arranged in the Child Study Center.
- 302. **Child Development III: School Age and Adolescence (4). Pr., FCD 267, 268. Fall, Winter, Spring.**
Physical, intellectual, and social development of children from school age through adolescence, emphasizing familial influences on development and behavior. Laboratory experiences may be arranged.
- 305. **Family II: Mate Selection and Marital Interaction (4). Pr., FCD 268. Fall, Spring.**
Theories of mate selection and marital interaction. Consideration of factors contributing to marital stability and success.
- 306. **Family III: Patterns of Family Interaction (4). Pr., FCD 268. Fall, Spring.**
Current theories of family interaction including normal and deviant patterns and their effects.
- 308. **The Family and Child Mental Health (4). Pr., FCD 267, 268. Winter, Summer.**
Impact of the family on children's emotional development.
- 310. **Techniques of Interviewing (2). Pr., consent of instructor or submission of initial application for internship. Fall, Spring.**
Principles and techniques of interviewing and establishing a helping relationship with individuals and groups.
- 323. **Man the Consumer (3). Pr., junior standing or consent of instructor. All quarters.**
Management of family resources and consideration of alternatives available to families as consumers. Consumer problems, use of information sources, and analysis of laws protecting consumers.

- 333. Consumer Oriented Legislation (5). Pr., FCD 323 or consent of instructor. Winter.**
Examination of laws involved in consumer protection and resources available for consumers. Use of economic theory and cost-benefit principles in analyzing consumer protection laws.
- 347. Laboratory Experiences with Young Children (2). Lab. 4. Pr., FCD 267, 268, 300. Fall, Winter, Spring.**
Supervised participation in the Child Study Center preschool programs.
- 350. Introduction to Day Care for Young Children (3). Pr., FCD 267, FCD 268, FCD 300, and FCD 301. Fall.**
Discussion of day care past and present. Exploration of theoretical and practical issues relating to day care programs serving children from infancy through preschool age. The variety of available child care services, policy issues and social legislation, licensing standards, and implications of day care for the family.
- 351. Development of Day Care Programs (3). Pr., FCD 350. Winter.**
Consideration of program dimensions and day care models including role of the teachers, children, families, volunteers, aids, resource personnel, and the community in developing a day care program. Inclusion of parents in supportive educational experiences. Research and evaluation in day care.
- 409. Undergraduate Research and Study. Credit to be arranged (1-5). May be repeated for a maximum of 5 credits. Pr., departmental approval of written application. All quarters.**
Consent for enrollment is based on a written proposal outlining the proposed course of study. Students should consult the department head for further information and approval forms.
- 410. Directed Reading in Family and Child Development. Credit to be arranged (1-3). Pr., consent of instructor. All quarters.**
May be repeated for a maximum of 3 credits.
- 420. Recent Research in Child Development (4). Pr., FCD 267, 268. Winter, Summer.**
Synthesis of recent research in child development with particular emphasis on studies dealing with family influences on children.
- 437. Learning Experiences for Young Children (3). Lec. 3. Pr., FCD 267, 268, and 300. Fall, Spring.**
Methods of promoting cognitive development of children.
- 437L. Learning Experiences for Young Children Laboratory (2). Lab. 6. Fall, Spring.**
Laboratory work in the child study laboratory. Hours to be arranged. Must be taken concurrently with corresponding lecture course.
- 443. Home Management Residence (5). Pr., CA 113, CA 115, CA 116, NF 112, FCD 157, FCD 323, CA 431, junior standing. All quarters.**
Residence in the home management house gives actual experience in different phases of homemaking with emphasis placed on the management process, satisfactory group relations, and development of individual initiative.
- 467. Parent Education (4). Pr., FCD 267, 268; SC 273. Fall, Winter, Summer.**
The principles of working with parents on both an individual and group basis. Laboratory experiences are arranged.
- 471. Administration of Programs for Young Children (3). Pr., FCD 437. Spring.**
Essential procedures in programming for young children, including housing, equipment, financing, staff, records, feeding, health protection, and community relations. Field trips may be arranged to selected children's centers.
- 477. The Aged and His Family (3). Pr., FCD 268. Spring.**
The aged and his family as affected by problems or health, finances, leisure time, housing and relationships. Laboratory experiences where needed.
- 487. Introduction to Field Experiences (2). Pr., SY 375 and departmental approval of application for internship. Pr. or coreq. FCD 310. Fall, Winter.**
Introductory course designed to help students prepare for maximum utilization of supervised professional experiences.
- 497. Directed Field Experience (5-15). Pr., departmental approval of application. All quarters.**
A, Social Services; B, Family and Child Development; C, Maternal and Child Health; D, Day Care and Programs for Young Children; E, Parent Programs; F, Family Economics. Field experiences to be arranged in approved community agencies, hospitals, clinics, or the department's Child Study and Family Life Center. All placements are made on an individual basis and are supervised by departmental staff.
- 499. Seminar (2). FCD 497 or consent of instructor.**

ADVANCED UNDERGRADUATE AND GRADUATE

- 541. Family Financial Management (5). Pr., FCD 323 or consent of instructor. Fall.**
Family financial planning, including short-term money management, long-term planning, allocation of family resources, and use of credit.

560. Management Problems in the Home (3). Pr., FCD 268, 323. Spring.

The processes of decision-making in families for achieving goals through the effective use of human and material resources. Analysis of case studies and examination of consumer and management problems at all socioeconomic levels.

568. Women's Changing Roles and Potentialities (3).

A critical analysis of women's changing roles in society. Effects of these changes on the family and on women's self-fulfillment and social contributions.

GRADUATE**605. Methods of Research in Home Economics (3). Pr., PG 215 or equivalent. Winter, Summer.**

Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Family and Child Development.

609. Special Problems (1-5). Pr., consent of instructor and approval of written application by major professor. May be taken for more than one quarter. Not to exceed 5 hours of credit toward the minimum of 48 for the M.S. degree. All quarters.

A, Family Relations; B, Child Development; C, Home Management; D, Family Economics; E, Marriage and Family Counseling; F, Parent Education.

610. Personality Development (4). Pr., FCD 267 or equivalent. Fall.

The development of personality of the child with particular emphasis on the effects of family interaction in the early years.

611. Advanced Child Development (4). Pr., FCD 610 or PG 433 or consent of instructor. Winter, Summer.

Review, interpretation, and evaluation of substantive areas of child development emphasizing changes in knowledge of these as a result of recent research.

616. Social Development of Children (4). Pr., FCD 611. Summer.

Theory and research related to the acquisition of social behavior by children.

618. Child Guidance (4). Pr., FCD 610 or PG 433 or consent of instructor. Winter.

Survey of principles and techniques of child guidance.

620. The Family and Its Relationships (4). Pr., SY 301, FCD 268, FCD 610 or PG 433, or consent of instructor. Fall.

Intensive study of the family and its effect on personality development.

621. Parent-Child Relations (4). Pr., FCD 268, FCD 610 or consent of instructor. Fall.

Discussion of parent-child relations and evaluation of relevant research literature.

622. Family Psychopathology (4). Pr., FCD 620 and PG 435. Winter.

Dynamics of psychopathology in families and critical evaluation of current theory and research.

623. Child and Family Study (4). Pr., FCD 611 or consent of instructor. Spring.

Survey of principles and methods for the study of children and their families. Students develop a case study of an individual child which requires intensive appraisal of his intellectual, personality, and social development and functioning.

624. Marriage and Family Counseling (4). Pr., FCD 610, 620, and 622; CED 628 or PG 638. Spring.

Discussion of individual, conjoint, and group techniques of marriage and family counseling.

625. Human Sexual Behavior (4). Pr., 610 and FCD 620; Pr., or coreq., FCD 622. Spring.

Nature of sexual development, normal and abnormal sexual functioning; attitudes toward sex. Treatment of sexual dysfunction.

626. Diagnosis in Marriage and Family Counseling (4). Pr., PG 415 or equivalent; pr. or coreq., FCD 624. Spring.

Analysis of testing, intake material, and case records. Development of diagnostic skill in dealing with family interaction.

628. Parental Education (4). Pr., SC 273, FCD 610, 611, and 620 or consent of instructor. Summer.

A study of parent education, its scope, aims, and effects on parent-child relationships.

629. Readings in Family Life and Child Development (4). Pr., FCD 267, FCD 268 or consent of instructor. All quarters.

Current literature and research concerning the pre-school child; the school-age child; the adolescent; the young adult; problems of later maturity; changing family patterns.

- 630. Recent Research in Family Economics and Home Management (4).** Pr., EC 200, 202, FCD 323, FCD 441, FCD 460 or consent of instructor. Fall.
Synthesis of recent research dealing with developments and trends in family economics and home management.
- 631. Readings in Family Economics and Home Management (1-4).** Pr., FCD 323, FCD 441, EC 200 or consent of instructor. Fall, Winter, Spring.
Independent readings in family economics and home management.
- 634. Economics Problems of Families (4).** Pr., EC 200, EC 202, FCD 323, FCD 441, FCD 460, CA 453 or consent of instructor. Winter.
Income distribution, cost of living, the business cycle, taxation, and economic provisions for unemployment, health, accidents, old age, and dependents.
- 636. Management of Family Resources. (4).** Pr., EC 200, EC 202, FCD 323, FCD 441, FCD 460 or consent of instructor. Spring.
Evaluation and balanced use of human and non-human resources in family living.
- 660. Seminar (1-5).**
A. Family Relations; B. Child Development; C. Home Management; D. Family Economics; E. Research Techniques; F. Marriage and Family Counseling; G. Parent Education.
- 662. Practicum (2-8). May be repeated for a maximum of 8 hours of credit. Pr., departmental approval. All quarters.**
A. Child Development; B. Family Relations; C. Parent Education; D. Day Care and Programs for Young Children; E. Marriage and Family Counseling.
- 699. Research and Thesis. Credit to be arranged. All quarters.**
Required of all students under the Thesis Option in any field.

Fisheries and Allied Aquacultures (FAA)

Professors Shell, Head, Dendy, Lawrence, Lovell, and Moss
Associate Professors Boyd, Pammat, Prather,
Ramsey, Rogers, and Smitherman
Assistant Professors Bayne, Davies, Plumb,
and Shelton
Research Associate Scarsbrook

- 210. Fish Culture (3). General elective. Winter.**
Construction and management of ponds, and the principles underlying fish production; also fishing methods, bait production, and the identification of the more common sport fish. (May not be taken for credit by students who have already earned credit in a more advanced course in fisheries.)
- 312. Practical Fish Culture (5). As arranged.**
Credit will be arranged for 3 months in a state or federal hatchery or in an approved commercial hatchery or on other phases of fish culture. All students wishing to take this course must obtain permission to do so from the Head of the Department.
- 498. Special Problems in Fisheries and Aquacultures (1-3). Pr., senior standing.**
A student can register for a total of not more than three hours credit.

ADVANCED UNDERGRADUATE AND GRADUATE

- 515. Limnology (5). Lec. 3, Lab. 6. Pr., CH 104, PS 205, BI 103. Spring.**
Biological, chemical, and physical factors affecting aquatic life.
- 516. Biological Productivity and Water Quality (5). Lec. 3, Lab. 6. Pr., CH 208 or consent of instructor. Fall.**
Biological and chemical measures of water quality in streams and impoundments as related to fisheries. Effects of pollution, fertilization, and feeding of fish upon water quality.
- 517. Management of Aquatic Flora in Fisheries and Aquaculture (5). Lec. 3, Lab. 6. Pr., or Coreq., BY 506 or 510 or equivalent and consent of instructor.**
The role of aquatic vegetation in fish production, its utilization and control. Summer.
- 519. Aquaculture (9). Pr. ZY 501, FAA and ZY 538.**
A lecture, laboratory, and field course introduces aquatic and marine biology students to the history, principles, problems, and procedures relating to the culture of commercially important crustaceans, fish, and mollusks along the Gulf coast. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.

- 528. Hatchery Management (5). Lec. 3, Lab. 4. Pr., BI 103. Spring.**
Operation of hatcheries for production of cold- and warm-water game fish and bait minnows; care of brood fish; methods of stocking, fertilizing, supplementary feeding, and controlling weeds; transportation of fish; control of parasites, and related hatchery problems.
- 530. Pond Construction (5). Lec. 1, Lab. 8. Fall.**
Principles and practice in the selection of pond sites, surveying and mapping pond areas, and construction of dams, spillways and diversion ditches.
- 536. Management of Small Impoundments (5). Lec. 3, Lab. 6. Pr., BI 103. Summer.**
Consideration of the species of fish used in management of small impoundments, species balance, population balance analysis, methods of correcting unbalanced conditions, renovation of old impoundments, and related problems of water management.
- 537. Fisheries Biology (3). Pr., BI 103. Winter.**
An introduction to the study of vital statistics of fish populations.
- 538. General Ichthyology (5). Lec. 3, Lab. 6. Pr., BI 103. Spring.**
Morphological, functional, geographical, and behavioral survey of fishes. Classification of fishes using monographs and keys. Field trips and laboratory work will emphasize local species.
- 544. Functional Morphology (3). Lec. 2, Lab. 3. Pr., BI 103, consent of instructor. Summer.**
Gross and micro-anatomical studies of representatives of principal fish groups from the Southeastern United States.
- 545. Fish Parasitology (5). Lec. 1, Lab. 6. Pr., BI 103. Fall.**
Basic concepts of fish parasitology and epizootiology, identification and control of fish parasites.
- 546. Fish Diseases (3). Lec. 1, Lab. 6. Spring. Pr., BY 300.**
Bacterial and viral diseases of fishes, their isolation, culture identification, and control.
- 547. Management of Streams and Large Impoundments (3). Lec. 3. Pr., FAA 537, or consent of instructor. Fall.**
Fish populations of streams and large impoundments and a consideration of methods for managing those populations.
- 548. Sampling Fish Populations (1). Lab. 4. Pr., or Coreq. FAA 547 or consent.**
Theory, equipment, and procedures for sampling fish populations.

GRADUATE

- 615. Advanced Fisheries Biology (5). Lec. 4, Lab. 3. Pr., FAA 537. Spring.**
The concepts of population dynamics of the interaction of reproduction, growth, and mortality in fish populations. Use of these concepts in fish population management.
- 617. Nutrient Cycles in Aquaculture (5). Lec. 3, Lab. 6. Pr., FAA 515, FAA 516 and ZY 306 or consent of instructor. Winter.**
An advanced discussion of physicochemical and biological dynamics of inorganic nutrients in freshwater habitats. Emphasis will be given to biological problems caused by nutrient imbalance, and to biological indicators of water quality.
- 618. Aquaculture (5). Pr., FAA 516. Winter.**
Principles underlying aquatic productivity and levels of management as demonstrated by domestic and foreign lotic and lentic cultures of fish and other aquatic crops.
- 620. Fish Processing Technology (5). Lec. 3, Lab. 6. Pr., CH 208 and BY 300 or ADS 514. Winter.**
Chemical and biological aspects of fishery products as they are related to the use of these products for human foods; principles of preservation, unit operations in processing; packaging, storage, and distribution.
- 621. Fish Nutrition (5). Lec. 3, Lab. 6. Pr., CH 208 and course in physiology or nutrition or consent of instructor. Summer.**
Fundamental and applied aspects of fish nutrition including the physiology of food assimilation, nutrient requirements, nutrient chemistry of feed sources, ration formulation and practical feeding.
- 624. Water Quality Management in Aquaculture (3). Lec. 3. Pr., FAA 516. Spring.**
Chemical, mechanical, and biological methods for maintaining and improving water quality in fish culture.
- 645. Advanced Fish Parasitology (3). Lec. 1, Lab. 6. Pr., FAA 545. Winter.**
The morphology, taxonomy, life history, ecology and pathological effects of parasites of fish.
- 646. Advanced Microbial Fish Diseases (3). Lec. 1, Lab. 6. Pr., FAA 546 or consent of instructor. Fall.**
Advanced study of the epizootiology, pathogenesis, isolation, taxonomy and immunology of bacterial and viral diseases of fish.
- 693. Seminar. (Credit to be arranged.)**
- 698. Special Problems in Fisheries and Allied Aquacultures (2-5).**
A. Aquaculture; B. Aquatic Ecology; C. Biology and Management; D. Ichthyology; E. Nutrition; F. Pathology; G. Processing and Technology.

699. **Research and Thesis. (Credit to be arranged.)**
 799. **Doctoral Research and Dissertation. (Credit to be arranged.)**

Food Science (FS)

The Food Science curriculum outlined on page 00 is administered by an inter-departmental committee, with the chairman located in the Department of Animal and Dairy Sciences. Food Science courses required in this curriculum are: ADS 101 Man's Food-3, ADS 201 Intr. Food Science and Technology-5, ADS 514 Food Microbiology-5, ADS 515 Food Plant Sanitation-5, HF 200 Food Science Seminar-1, HF 340 Industrial Food Preservation Technology-5, HF 543 Food Analysis and Quality Control-5, HF 545 Food Chemistry-3.

A curriculum in Food Industry Management administered by the School of Business is outlined in the narrative section of the School of Business.

Foreign Languages (FL)

Professors Cantrell and Peak

Research Professor Comparative Linguistics Skelton

Associate Professors DiOrio, Head, Helmke, Phillips, and Posniak

Assistant Professors Brann, Gaar, Howard, Kouidis, Latimer, Madrigal, Morris, K. Olson, Perricone, Spencer, Warbington, and Wolverton

Instructors Allen, Cox, Elmore, Millman, S. Olson, Thomas, and Vandegriff

It is to the student's advantage to begin foreign language at the highest possible level because by so doing he can gain college credits through advanced placement. On the basis of the Foreign Language Department's evaluation of his previous foreign language training and/or test scores, he may enter the second, third, or fourth quarter course in a language. If he makes a grade of C or higher, he will receive 10, 15, or 20 hours, respectively (5 credit hours for the course and 5, 10, or 15 hours, respectively, for advanced placement). If the student is well enough prepared, he may enter at a level higher than the fourth quarter, but he will not receive more than 15 hours through advanced placement.

If he does not earn at least a C, he will not be granted advanced placement credit. He may then enter the language at a lower level, re-enter at the same level, or attempt another approved language.

Credits earned through advanced placement may be applied toward graduation as well as toward foreign language requirements in various curricula.

Language Proficiency Courses

080. **Proficiency in English for Foreign Students. No credit. May be repeated.**

Individualized and small group instruction primarily for foreign graduate students who need to obtain greater proficiency in comprehension and in spoken and written English, including idiomatic expressions and cultural adaptation.

127-128. **Reading Proficiency in French. No credit. Lec. 3. Pr. for FL 128, departmental consent. Winter and Spring.**

Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 128 channels students into their field of study, e.g., humanities, social sciences, and sciences.

137-138. **Reading Proficiency in Spanish. No credit. Lec. 3. Pr. for FL 138, departmental consent. Winter and Spring.**

Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 138 channels students into their field of study, e.g., humanities, social sciences, and sciences.

157-158. Reading Proficiency in German. No credit. Lec. 3. Pr. for FL 158, departmental consent. Winter and Spring.

Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 158 channels students into their field of study, e.g., humanities, social sciences, and sciences.

177-178. Reading Proficiency in Russian. No credit. Lec. 3. Pr. for FL 178, departmental consent. Winter and Spring.

Primarily for graduate students who should consult their advisers for specific departmental language requirements. FL 178 channels students into their field of study, e.g., humanities, social sciences, and sciences.

Latin

111-112-113. First Year Latin I-II-III (5-5-5). FL 111 pr. for FL 112; FL 112 pr. for FL 113.

Fundamentals of Latin: language skills stressed with increasing emphasis on reading, including selections from ancient authors.

French

121-122-123. First Year French I-II-III (5-5-5). FL 121 pr. for FL 122; FL 122 pr. for FL 123.

Fundamentals of French: language skills stressed with progressive emphasis on conversation. Exposure to French civilization.

221-222-223. Second Year French I-II-III (5-5-5). Pr., FL 123 or equivalent. FL 221 pr. for FL 222; FL 222 pr. for FL 223 (Exceptions to this sequence may be granted by departmental consent or when course offerings so require).

Language skills stressed: structural review and composition; reading in French literature; exposure to French civilization.

321. French Conversation (3 or 5*). Pr., FL 223 or equivalent. Maybe repeated once for credit but counted only once toward a major. Fall.

Practice in spoken, everyday French, based on texts and situations concerning contemporary life especially in France.

322. French Composition (3 or 5*). Pr., FL 223 or equivalent. May be repeated once for credit but counted only once toward a major. Winter.

Practice in writing letters, brief articles, themes and reports, based on original composition and on translation.

323. French Civilization (3 or 5*). Pr., FL 223 or equivalent. Spring.

A presentation of the cultural heritage of France including present day institutions.

324. Survey of French Literature I (3 or 5*). Pr., FL 223 or equivalent. Fall.

Readings in French literature from the Middle Ages through the seventeenth century.

325. Survey of French Literature II (3 or 5*). Pr., FL 223 or equivalent. Winter.

Readings in French literature from the eighteenth and the early nineteenth centuries.

326. Survey of French Literature III (3 or 5*). Pr., FL 223 or equivalent. Spring.

Readings in French literature from the latter nineteenth and the twentieth centuries.

327. Seminar in French Literature (3 or 5*). Pr., FL 223 or equivalent. Summer.

Readings in French literature from selected periods. Normally offered in Summer quarter only.

421. French Poetry (3 or 5*). Pr., four 300-level French courses or equivalent. Alternate Fall.

Consideration, analysis, and criticism of selected French poetry.

422. French Prose (3 or 5*). Pr., four 300-level French courses or equivalent. Alternate Winter.

Consideration, analysis, and criticism of selected French prose.

423. French Theater (3 or 5*). Pr., four 300-level French courses or equivalent. Alternate Spring.

Consideration, analysis, and criticism of selected French drama.

424. French Literature Since World War II (3 or 5*). Pr., four 300-level French courses or equivalent. Alternate Fall.

Consideration, analysis, and criticism of selected authors and movements in letters, theater, cinema, and other media.

*300 and 400-level French and Spanish courses will carry 5 quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

- 425. French Literature Outside Continental France (3 or 5*). Pr., four 300-level French courses or equivalent. Alternate Winter.**
Consideration, analysis, and criticism of selected French literature from Africa, the Antilles, Canada, and other French-speaking areas.
- 426. Seminar in French Literature (3 or 5*). Pr., at least one 400-level French course. Alternate Spring.**
Concentrated study on an author, period, or movement of special interest for superior students going beyond the minimum requirements.
- 427. Independent Work in French (3 or 5*). Pr., at least one 400-level French course and consent of instructor.**
Directed study in area of special interest, for the superior student in French. May be repeated once for credit.

Spanish

- 131-132-133. First Year Spanish I-II-III (5-5-5). FL 131 pr. to FL 132; FL 132 pr. to FL 133.**
Fundamentals of Spanish. Language skills stressed with progressive emphasis on conversation. Exposure to Hispanic civilization.
- 231-232-233. Second Year Spanish I-II-III (5-5-5). Pr., FL 133 or equivalent. FL 231 pr. to FL 232; FL 232 pr. to FL 233. (Exceptions to this sequence may be granted by departmental consent or when course offerings so require.)**
Language skills stressed: structural review and composition; reading in Spanish literature; exposure to Hispanic civilization.
- 331. Spanish Conversation (3 or 5*). Pr., FL 233 or equivalent. May be repeated once for credit but counted only once toward a major. Fall.**
Intensive practice in the spoken language, with simultaneous review of vocabulary and structure.
- 332. Spanish Composition (3 or 5*). Pr., FL 233 or equivalent. May be repeated once for credit but counted only once toward a major. Winter.**
Practice in writing letters, brief articles, themes and reports, based on original composition and translation.
- 333. Hispanic Civilization (3 or 5*). Pr., FL 233 or equivalent. Spring.**
Intensive exposure to the culture of Spain and Spanish America, as reflected in the fine arts and literature. Emphasis on geographic, historical, social, artistic, spiritual, and political forces in Hispanic civilization and its contribution to world cultures.
- 334. Survey of Spanish Literature to 1700 (3 or 5*). Pr., FL 233 or equivalent. Fall.**
Development of Spanish literature from its beginnings through the Golden Age (1700).
- 335. Survey of Spanish Literature from 1700 (3 or 5*). Pr., FL 233 or equivalent. Winter.**
Development of Spanish literature from the Decadencia (1700) to the contemporary period.
- 336. Survey of Spanish American Literature (3 or 5*). Pr., FL 233 or equivalent. Spring.**
Panorama of literature in Spanish America from pre-Columbian times to present.
- 337. Seminar in Hispanic Literature (3 or 5*). Pr., FL 233 or equivalent. Summer.**
Readings in Hispanic literature from selected genres, authors, periods, or movements.
- 431. Spanish American Prose (3 or 5*). Pr., four 300-level Spanish courses or equivalent. Alternate Winter.**
Representative works in the novel, short story, or essay in Spanish America.
- 432. Spanish Prose (3 or 5*). Pr., four 300-level Spanish courses or equivalent. Alternate Fall.**
Representative works in the novel, short story, or essay in Spain.
- 433. Spanish American Poetry (3 or 5*). Pr., four 300-level Spanish courses or equivalent. Alternate Winter.**
Readings in the poetry of Spanish America with emphasis on literary movements and their characteristics.
- 434. Spanish Poetry (3 or 5*). Pr., four 300-level Spanish courses or equivalent. Alternate Fall.**
Readings in the poetry of Spain with emphasis on literary movements and their characteristics.
- 435. Spanish American Theater (3 or 5*). Pr., four 300-level Spanish courses or equivalent. Alternate Spring.**
Survey of major Spanish American plays of the modern and contemporary period.
- 436. Spanish Theater (3 or 5*). Pr., four 300-level Spanish courses or equivalent. Alternate Spring.**
Survey of Spanish plays from the Renaissance to the contemporary period.

*300 and 400-level French and Spanish courses will carry 5 quarter hours of credit *only* when taken in the Alabama-Auburn Academic Summer Abroad Program.

- 437. Seminar in Hispanic Literature (3 or 5'). Pr., at least one 400-level Spanish course and consent of instructor. Alternate Summer.**

Readings in Hispanic literature from selected genres, authors, periods, or movements. Offered only in Summer Quarter. May be repeated once for credit.

Italian

- 141-142-143. First Year Italian I-II-III (5-5-5). FL 141 pr. to FL 142; FL 142 pr. to FL 143.**

Fundamentals of Italian. Language skills stressed, with progressive emphasis on conversation. Exposure to Italian civilization.

- 241-242-243. Second Year Italian I-II-III (5-5-5). Pr., FL 143 or equivalent. FL 241 pr. to FL 242; FL 242 pr. to FL 243. (Exceptions to this sequence may be granted by departmental consent or when course offerings so require.)**

Stress on language skills; structural review and composition; readings in Italian literature and exposure to Italian civilization.

German

- 151-152-153. First Year German I-II-III (5-5-5). FL 151 pr. to FL 152; FL 152 pr. to FL 153.**

Fundamentals of German. Stress on language skills, with progressive emphasis on conversation. Exposure to Germanic civilization.

- 251-252-253. Second Year German I-II-III (5-5-5). Pr., FL 153 or equivalent. FL 251 pr. to FL 252; FL 252 pr. to FL 253. (Exceptions to the sequence may be granted by departmental consent or when course offerings so require.)**

Stress on language skills; structural review and composition; readings in German literature and exposure to German civilization.

- 351. German Conversation (3). Pr., FL 251 or equivalent. Fall.**

Practice in spoken, everyday German, based on texts and situations concerning contemporary life in Germany or other German-speaking countries.

- 352. German Composition (3). Pr., FL 251 or equivalent. Winter.**

Practice in writing letters, brief articles, themes and reports based on original composition and on translation.

- 353. German Civilization (3). Pr., FL 251 or equivalent. Spring.**

Review of the cultural heritage of the German language, with emphasis on its present-day status, influence and civilization in Germany and abroad.

- 354. Survey of German Literature I (3). Pr., FL 253 or any two German courses on the 300-level. Fall.**

Readings in German literature of the earliest periods to the eighteenth century.

- 355. Survey of German Literature II (3). Pr., FL 253 or any two German courses on the 300-level. Winter.**

Readings in German literature of the nineteenth century.

- 356. Survey of German Literature III (3). Pr., FL 253 or any two German courses on the 300-level. Spring.**

Readings in German literature of the twentieth century.

- 357. Seminar in German Literature (3). Pr., FL 251 or equivalent. Summer.**

Readings in German literature from selected periods. Normally offered in Summer Quarter only.

- 451. German Classicism (3). Pr., four 300-level German courses or equivalent. Alternate Fall.**

Consideration, analysis, and criticism of German writing of the classical period.

- 452. German Romanticism (3). Pr., four 300-level German courses or equivalent. Alternate Winter.**

Consideration, analysis, and criticism of German Romantic writing.

- 453. German Realism and Naturalism (3). Pr., four 300-level German courses or equivalent. Alternate Spring.**

Consideration, analysis, and criticism of German writing of Realism and Naturalism.

- 454. German Drama (3). Pr., four 300-level German courses or equivalent. Alternate Fall.**

Consideration, analysis, and criticism of selected German theater.

- 455. Twentieth Century German Literature (3). Pr., four 300-level German courses or equivalent.**

Consideration, analysis, and criticism of selected German prose prior to World War II.

*300 and 400-level French and Spanish courses will carry 5 quarter hours of credit only when taken in the Alabama-Auburn Academic Summer Abroad Program.

- 456. Contemporary German Literature (3).** Pr., four 300-level German courses or equivalent.
Consideration, analysis, and criticism of selected German writing since World War II.
- 457. Independent Work in German (3).** Pr., at least one 400-level German course and consent of instructor.
Directed study in area of special interest for the superior student in German. May be repeated once for credit.

Portuguese

- 161-162-163. First Year Portuguese I-II-III (5-5-5).** FL 161 pr. to FL 162; FL 162 pr. to FL 163.
Fundamentals of Portuguese. Stress on language skills; progressive emphasis on conversation. Exposure to Luso-Brazilian civilization.
- 261-262-263. Second Year Portuguese I-II-III (5-5-5).** Pr., FL 163 or equivalent. FL 261 pr. to FL 262; FL 262 pr. to FL 263. (Exceptions to this sequence may be granted by departmental consent or when course offerings so require.)
Stress on language skills; structural review and composition; readings in Luso-Brazilian literature. Exposure to Luso-Brazilian civilization.

Russian

- 171-172-173. First Year Russian I-II-III (5-5-5).** FL 171 pr. to FL 172; FL 172 pr. to FL 173.
Fundamentals of Russian. Stress on language skills; progressive emphasis on conversation. Exposure to Russian civilization.
- 271-272-273. Second Year Russian I-II-III (5-5-5).** Pr. FL 173 or equivalent. FL 271 pr. to FL 272; FL 272 pr. to FL 273. (Exceptions to this sequence may be granted by departmental consent or when course offerings so require.)
Stress on language skills; structural review and composition. Readings in Russian literature; continued exposure to Russian civilization.
- 371. Russian Literature from 1820-1860 in Translation (3).**
Literary history of the period; selected works by Pushkin, Lermontov, Gogol, Goncharov, Turgenev.
- 372. Russian Literature from 1860-1917 in Translation (3).**
Dostoevsky, Tolstoy, Chekhov.
- 373. Soviet Russian Literature 1917 to Present in Translation (3).**
Gorky, Sholokhov, Mayakovsky, Pasternak, Solzhenitsyn and others.

GRADUATE COURSES IN FRENCH AND SPANISH

A non-sequential offering of courses required of students pursuing the degrees of Master of Arts in French, Master of Arts in Spanish, Master of French Studies, Master of Hispanic Studies, and Master of Arts in College Teaching. Representative works, literary movements, and techniques of literary criticism within respective genres of French, Spanish American, and Spanish literature are emphasized and analyzed in depth. A background in Romance linguistics and Old French and Old Spanish is presented and required of all Master's candidates. Courses may be taken concurrently.

FRENCH GRADUATE COURSES

- 603. Romance Linguistics (5).** Pr., consent of instructor.
The development of Latin into the medieval and modern forms of the Romance languages, involving a comparison of Classical Latin with Early and Vulgar Latin and the main changes in phonology, morphology, and syntax of the latter into Italian, Spanish, Portuguese, French, and Rumanian. Some attention will be given to the history of Rome, of the Empire, and of the Celtic, Germanic, and Moorish invasions.
- 621. Old French Language and Literature (5).**
The internal and external history of the language together with readings from various Medieval French literary works including *La Chanson de Roland*.
- 622. Sixteenth-Century French Literature (5).**
Development of French literature during the sixteenth century. The Renaissance and Humanism are traced through such major authors as Marot, Rabelais, Ronsard, DuBellay and Montaigne. Questions of historical, philosophical and esthetic nature are considered.
- 623. Seventeenth-Century French Literature (5).**
Development of French literature during the seventeenth century. Literary movements, such as *préciosité* and Neoclassicism, are treated through the works of representative authors.

624. Eighteenth-Century French Literature (5).

The development of French literature during the eighteenth century. The enlightenment and Pre-Romantic movement are considered through various literary works and genres (essays, *contes philosophiques*, plays, novels) by major authors.

625. Nineteenth-Century French Literature (5).

Development of French literature during the nineteenth century. Romanticism, Realism, Naturalism and Symbolism are studied through the works of representative authors.

626. Twentieth-Century French Literature (5).

Development of French literature during the twentieth century. An in-depth study and analysis of major contemporary literary movements in all genres, with special emphasis on Surrealism and Existentialism. Attention is also given to present and continuing literary trends.

627. Advanced French Conversation and Phonetics (5).

Training in oral French to increase vocabulary, improve fluency and pronunciation.

628. Advanced French Composition and Stylistics (5).

Exercises in advanced grammar and syntax designed to enhance the student's linguistic sensitivity. Training in composition and in the use of stylistic devices derived from significant literary sources.

629. Seminar in Advanced Language Skills (5).

Training in writing and speaking French. Exercises include compositions, *explications de textes* and *exposés oraux*.

660. Seminar in French Literary Genres (5). Summer. May be repeated once for credit.

Intensive study and analysis of selected literary genres.

661. Seminar in French Literary Movements (5). Summer. May be repeated once for credit.

Intensive readings in French literature from selected movements.

699. Research and Thesis (5).**SPANISH GRADUATE COURSES****603. Romance Linguistics (5). Pr., consent of instructor.**

The development of Latin into the medieval and modern forms of the Romance languages, involving a comparison of Classical Latin with Early and Vulgar Latin and the main changes in phonology, morphology, and syntax of the latter into Italian, Spanish, Portuguese, French, and Rumanian. Some attention will be given to the history of Rome, of the Empire, and of the Celtic, Germanic, and Moorish invasions.

631. Old Spanish Language and Literature (5).

The internal and external history of the language together with readings from the *Poema del mio Gid*, *Gonzalo de Berceo*, *Juan Ruiz*, and *Alfonso el Sabio*. The role of the Ligurians, Iberians, Carthaginians, Greeks, Celts, Romans, Vandals, Visigoths, and Moors in the history of Spain and the Spanish language.

632. Spanish Prose I (5).

Development of early prose fiction through the Siglo de Oro, with special emphasis on the works of Cervantes.

633. Spanish Prose II (5).

The continuing development of fiction from the eighteenth century to modern times, with special attention to the novel of the twentieth century.

634. Spanish Theater I (5).

Development of the drama through the Siglo de Oro, with emphasis on important works by Lope de Vega, Calderón, Tirso de Molina, and Ruiz de Alarcón.

635. Spanish Theater II (5).

The continuing development of the drama through the Decadencia, Romanticismo, Siglo XIX, Generación de '38, Modernismo, and the Posguerra.

636. Spanish Poetry (5).

The development of poetic forms, of leading movements and principal poets in Spain, from the earliest *jarchas* to the contemporary period.

637. Spanish American Poetry (5).

The development of poetic forms, of leading movements and principal poets in Spanish America from the pre-Columbian epoch to the contemporary period.

638. Spanish American Prose I (5).

An intensive survey of the novel in Spanish America in the modern and contemporary periods.

639. Spanish American Prose II (5).

An intensive survey of the short story and essay in Spanish America in the nineteenth and twentieth centuries.

640. Seminar in Advanced Spanish Composition and Stylistics (5). Summer. May be taken twice for credit.

Advanced training in Spanish composition and stylistics with specific course materials determined by needs of students.

- 641. Seminar in Hispanic Literature (5). Summer. May be taken twice for credit.**
Intensive readings in Hispanic literature from selected genres, authors, periods, or movements.
- 699. Research and Thesis (5).**

Forestry (FY)*

Professors DeVall, Head, Hodgkins, and Johnson
Associate Professors Beals, Larsen, and Posey
Assistant Professors DeBrunner and Golden
Instructor Janes

- 105. Forestry Convocation (0). Fall, Winter, Spring.**
A semi-quarterly forum required of all forestry students except in summer quarters. Visiting lecturers from all segments of federal, state, and private forestry will discuss topics of importance to the forest economy and interest to students.
- 201. Dendrology (5). Lec. 3, Lab. 6. Pr., BI 102, or consent of instructor. Fall.**
Taxonomy and identification of the important forest trees of the United States and Canada. The major natural species groups, their geographic distribution and their typical site occurrence are outlined.
- 203. Forest Cartography (3). Lec. 1, Lab. 6. Pr., MH 160.**
Use of drafting instruments in the construction of grids and planimetric and topographic maps; use of staff compass, tape, and plane table in map control and detail compilation; mapping accuracy requirements; engineering lettering; and map design.
- 204. Forest Mensuration (5). Lec. 3, Lab. 6. Pr., FY 203, FY 201. Spring.**
Measurement theory; methods and equipment used in measuring trees and stands; units of measure used in forestry; log rules and volume tables; condition class mapping; elementary timber estimating; stand and stock tables.
- 205. Wood Identification and Uses (3). Lec. 1, Lab. 4. Fall, Spring.**
Identification of the commercial woods of the United States by macroscopic features, elementary wood anatomy, sufficient to permit an understanding of wood properties and the suitability of certain woods for specific uses. Introduction to the major uses of wood and the basic principles of lumber grading.
- 206. Wood Measurements (3). Lec. 2, Lab. 3. Pr., MH 160 or equivalent. Spring.**
Wood measurements oriented toward the needs of students in wood technology.
- 210. Wood and Art (1). Lab. 2.**
The student will be introduced to wood terminology and to the use of wood in art forms in comparison with metal and stone. The unique properties of selected species will be studied.
- 303. Silvics I (5). Lec. 4, Lab. 3. Pr., BI 102, CH 104. Winter.**
Relationships between site factors and the internal structure, metabolism and growth of individual trees.
- 307. Silvics II (5). Lec. 3, Lab. 6. Pr., AY 305, FY 201, FY 303. Spring.**
Effects of site, competition and cultural practices on the establishment, development and yield of forest stands. Reciprocal effects of forest cover on the site.
- 309. Sampling (5). Lec. 4, Lab. 3. Pr., MH 151 or consent of instructor. Winter.**
Basic statistical and sampling concepts and procedures as applied to forestry problems.
- 310. Advanced Mensuration (3). Lec. 2, Lab. 3. Pr., FY 204, FY 309. Spring.**
Statistical decision theory. Stratified sampling, including testing for effectiveness of stratification, allocation of the sample, and sample size. Inventories with probability proportional to size (point sampling). Forest growth and yield. Nature and use of yield tables. Stand projection methods. Growth percent.
- 311. Wood Anatomy (5). Lec. 3, Lab. 6. Pr., FY 205. Fall.**
Identification of commercial woods of industry by microscopic features. Comparative anatomy and phylogenetic relationships. Introduction to microtechnique and maceration techniques.
- 313. Farm Forestry (5). Lec. 5. Pr., sophomore standing. Fall, Winter.**
(Not open to students in the degree Forestry curricula.) The place of farm forests in agricultural economy. The application of forestry principles to the problems of the farm woodland, especially as they relate to Alabama conditions.
- 330. Forest Products (5). Lec. 3, Lab. 6. Pr., FY 205 or FY 311. Fall.**
Specifications, grading and manufacture of wood products derived from forest lands, including an introduction to pulp and paper manufacture and other chemical and mechanical processes utilizing wood.
- 370. Wood as an Art Medium (3). Lec. 1, Lab. 4. For students majoring in the Fine Arts. Winter.**
Basic technology and properties of wood as applied to its use as an art medium. Wood identification, design of wood forms, and effect of moisture on the dimensional stability of wood. Design problems involving wood.

*The prerequisite may be waived by permission of the instructor concerned, for junior and senior students in other departments.

- 402. Forest Fire Control and Use (3). Lec. 2, Lab. 3. Pr., FY 307, junior standing. Winter.**
Forest fire protection. Use of fire as a silvicultural tool. Public relations problems. Extended field trips will be made.
- 403. Forest Recreation (3). Lec. 1, Lab. 6. Summer.**
Planning and administration of recreation in forest land management. Extended field trips will be made.
- 408. Logging (3). Lec. 2, Lab. 3. Pr., FY 204. Fall.**
Logging methods and the factors affecting the costs in each phase of logging. Field practice given in the safe use of mechanical logging equipment.
- 460. Wildland Recreation Philosophy and Policy (3). Fall.**
The philosophy and policy of wildland recreation. Laws and traditions at federal, state, and local levels of government as well as industrial and other landowners' outlooks and developments relative to wildland recreation will be discussed.
- 461. Recreational Land Classification (3). Lec. 1, Lab. 6. Pr., FY 460. Spring.**
Land classification for various recreational uses will be reviewed and discussed from an economic viewpoint. Extended field trips will be required.
- 469. Recreational Site Management (3). Pr., FY 461, Coreq., FY 507. Spring.**
Management of recreational sites so as to take into account all of the resources of the land as well as the human and economic forces influencing that management will be examined.
- 490. Field Mensuration (5). Lec. 2, Lab. 9. Pr., FY 310. Summer.**
Application of sampling theory and forest mensurational principles to the design of forest resource inventories.
- 491. Forest Engineering (5). Lec. 2, Lab. 9. Pr., FY 203. Summer.**
Application of the principles of civil engineering to forest field conditions. Practical experience in road location, land surveying, and topographic surveying for recreational purposes.
- 492. Forest Site Evaluation (2). Lec. 1, Lab. 3. Pr., GL 102, FY 307, junior standing. Spring.**
Theoretical and field training in the classification and evaluation of forest habitats and land for various uses. Overnight field trips are required.
- 493. Forest Regeneration (3). Lec. 1, Lab. 6. Pr., FY 307. Summer.**
Field observation and evaluation of natural and artificial methods of regeneration of forest types, with emphasis on ecological factors. Extended field trips will be made.
- 494. Forestry Tour (1). Lab. 3. Offered only under the "Satisfactory/Unsatisfactory" option. Summer.**
A one-week tour to points of outstanding interest to foresters.
- 495. Forestry Problems (1-5 each). Pr., consent of instructor, and approval of department head, junior standing. Maximum of 10 hours in all areas as credit toward the Bachelor of Science degree. Areas of study defined as in FY 691.**
- 499. Senior Thesis (5). senior standing.**
A problem in the student's area of interest. Will test ability of student to do thorough library research as well as any needed laboratory or field work. A comprehensive report, written in the style of a graduate thesis, is required.

ADVANCED UNDERGRADUATE AND GRADUATE

- 507. Forest Management (5). Lec. 5. Pr., FY 520, FY 538. Spring.**
General principles applicable to the organization, administration and regulation of forest properties primarily for the production of crops of timber.
- 513. Microtechnique of Hard Materials (5). Lec. 1, Lab. 12. Pr., FY 311 or consent of instructor.**
Preparation and sectioning of hard materials for microscopic study. Care and use of the sliding microtome and diamond saw, staining, counterstaining and mounting of sections.
- 515. Range Management (2). Lec. 2. Pr., FY 307 or BY 413. Fall.**
Survey of range management as applied to forest properties.
- 517. Photogrammetry (5). Lec. 3, Lab. 6. Pr., FY 310 or consent of instructor. Spring.**
Use of aerial photographs in Forestry. Particular emphasis is placed on specifications for forestry photographs, basic map control, planimetric mapping, timber type mapping and timber volume estimation.
- 520. Silviculture (5). Lec. 3, Lab. 6. Pr., FY 307 or BY 413. Fall.**
Methods of controlling establishment, composition, growth, and quality of forest stands. Overnight field trips, not to exceed three, will be required.
- 521. Forest Research Methods (3). Lec. 2, Lab. 3. Pr., FY 309 or MH 163. Winter, Spring.**
Review of statistical and sampling methods. Experimental design and analysis of data.

- 525. Wood Gluing and Lamination (5). Lec. 3, Lab. 6. Coreq., FY 311; Pr., PS 205. Winter.**
Types and characteristics of woodworking glues. The theory, design, and manufacture of laminates and other glued products. The student will be introduced to research techniques and procedures by pursuing a specific study that will culminate in a comprehensive report.
- 531. Mechanical Properties of Wood (5). Lec. 3, Lab. 6. Spring.**
Mechanical properties of wood, factors affecting the strength of wood, principles used in the design of wood structures. Testing procedures.
- 532. Seasoning and Preservation of Wood (5). Lec. 5. Pr., FY 311. Winter.**
Principles and practices of seasoning and impregnation of wood, study of wood destroying agencies.
- 533. Seasoning and Preservation Laboratory (2). Lab. 6. Pr., FY 532. Spring.**
Required for wood technology majors only. Laboratory study of techniques and equipment used in the seasoning and impregnation of wood.
- 534. Forest Policy and Law (3). Lec. 3. Spring.**
Development of forest policy in the United States against the background of cultural heritages and economic situations. Forest Laws, National and State, as influenced by and as influencing policy.
- 535. Forest Products Marketing (3). Lec. 2, Lab. 3. Pr., FY 204, FY 205. Winter.**
An introduction to the forest products available for sale from large forest properties, the marketing channels through which they move, their comparative prices and production costs, and their measurement.
- 536. Forest Watershed Management (3). Lec. 2, Lab. 3. Pr., GL 102 and FY 303, AY 304, or AY 305 and BY 413. Winter.**
Forest hydrology as a specialized branch of forest ecology. The use of forests and forestry practices for the regulation of streamflow. An overnight field trip is required.
- 537. Forest Economics I (3). Pr., AS 202 or EC 200. Fall.**
Fundamentals of economics as applied to forestry. Supply, demand and price relationships, predictions for the future. Marginal analysis as applied to forestry enterprises. Bases and methods of forest valuation in the determination of stumpage, damages, alternatives and land. Taxes, their valuation and effect upon forest properties. Insurance and credit in forest ventures.
- 538. Forest Economics II (3). Pr., FY 537. Winter.**
Input-output relationships in forest production. Computation of financial maturity of trees and stands. Competition for resources in the management of forest properties. Uses of land and evaluation of intangible values associated with land.
- 590. Seminar in Forestry (1). Pr., senior standing. Spring.**
Advanced current literature and recent developments, with written and verbal reports on selected problems. Required of all graduate students in forest management and wood technology and all seniors in the Honors Program.
- 601. Wood Chemistry (5). Lec. 2, Lab. 9. Pr., FY 330, CH 203.**
Detailed physical and chemical nature of cellulose and modified cellulose and their derivatives. Study of the lignocellulose complex. The chemical analysis of wood.
- 610. Forest Tree Improvement (5). Lec. 4, Lab. 3. Pr., ZY 300 or consent of instructor.**
Principles of heredity as applied to forest trees and their management. Review of current knowledge in tree improvement. Principles of forest tree breeding. Study and evaluation of activities designed to produce genetically improved trees.
- 611. Forest Soils (5). Lec. 3, Lab. 6. Pr., AY 304 or AY 305.**
Importance of morphological, physical and chemical properties of forest soils in relation to growth of trees. Classification of forest soils on the basis of productivity. Special emphasis on forest soils in the southern pine region.
- 613. Forest Community Investigations (5). Lec. 2, Lab. 8. Pr., GL 102, or AY 304 or AY 305; FY 307 or BY 413.**
Methods of detecting, measuring, describing and analyzing forest communities and community types. Application to the study of forest ecosystems.
- 617. Remote Sensing (3). Lec. 2, Lab. 3. Pr., PS 206 or PS 221, and BY 413 or equivalent, or consent of instructor.**
Spectral regions. Reflectance and emission of electro-magnetic energy. Types of remote sensing systems, including: photographic, in the visible and infrared spectral regions; lisscanning in the visible and infrared spectral regions; and radar. The applications of remote sensing imagery to non-urban management.
- 691. Directed Study (1-5). Directed Study limited to a maximum of 5 hours in any specified area and to a maximum of 15 hours in all areas as credit towards the Master of Science degree. All quarters.**
Areas of Directed Study: (A) Forest Management, (B) Forest Economics, (C) Forest Sampling, (D) Regression Analysis, (E) Linear Programming, (F) Forest Photogrammetry, (G) Forest Mensuration, (H) Forest Engineering, (I) Forest Soils, (J) Forest Ecology, (K) Forest Genetics, (L) Tree Physiology, (M) Wood Anatomy & Quality, (N) Uses of Wood & Derived Products, (O) Chemistry of Wood Glues, Finishes, & Impregnants, (P) Timber Physics, (Q) Recreation, and (R) Remote Sensing.
- 695. Special Problems (3-8). All quarters. Area of study defined in FY 635.**
A special problem in forestry or wood utilization. Such a problem will be of lesser magnitude than a thesis but will test the student's ability to do thorough library research as well as any needed laboratory or field work, and to prepare a comprehensive report on his findings. The work may be spread over more than one quarter, but shall be limited to a total of eight quarter hours.

699. **Research and Thesis. Credit to be arranged.**
 799. **Research and Dissertation. Credit to be arranged.**

Geography (GY)

Assistant Professors Bagwell, *Coordinator*, Bushey,
 Dawsey, Dorman, Icenogle, and Jeane

102. **Principles of Geography (5). Not open to juniors or seniors except with consent of instructor.**
 Man and his work in relation to the Earth as a planet, location, climate, land forms, water bodies, minerals, soils, biota.
214. **Introduction to Physical Geography (5).**
 Selected elements of the earth's physical system to include such items as landforms, basic weather elements, soils, and vegetation.
215. **Introduction to Cultural Geography (5).**
 Selected elements of cultural geography to include basic concepts, review of literature, and influence of man in changing the face of the earth.
300. **Weather and Climate (5).**
 Weather and climate: causes and controls. Characteristics and distribution of world climates and their economic and social effects.
302. **Economic Geography (5).**
 Distribution and environmental relationships of man's principal economic activities.
303. **Geography of the Soviet Union (5). General elective.**
 The physical and human geography of the U.S.S.R. and its role in international affairs.
304. **Geography of South America (5).**
 A regional survey of economic and social developments, resources and products.
305. **Geography of Anglo-America (5).**
 Human-use regions, resources, social and economic developments will be studied.
306. **Geography of Europe (5).**
 The influences of climate, surface features, and natural resources on the distribution of peoples, their industries and routes of trade. Consideration will be given to each country within its regional setting and to the relationship of Europe to the remainder of the world.
307. **Geography of Asia (5).**
 Climate, topography, and natural resources and their influence upon the distribution of peoples, industries and commerce.
308. **Geography of Africa (5).**
 The principal regions of Africa with particular emphasis on the areas and countries of greater economic and international importance.
401. **Political Geography (5). General elective.**
 The interaction between the natural-physical environment and the international activities of world powers. Emphasis on the changing geographic and economic patterns in world affairs.
440. **Cartography (5). Pr., consent of instructor or junior standing.**
 Techniques of map construction, with attention given to both the drafting and interpretation of maps and other graphic presentations.

ADVANCED UNDERGRADUATE AND GRADUATE

500. **Development of Geographic Thought (5). Pr., consent of instructor.**
 The development of modern geographic thinking with special attention to the methodology employed in the science of geography.
504. **Advanced Physical Geography (5). Pr., consent of instructor or GY 214.**
 Geomorphological approach to the study of landforms in addition to in-depth analysis of earth systems.
505. **Advanced Cultural Geography (5). Pr., consent of instructor or GY 215.**
 Analysis of selected themes within the general field of cultural geography that illustrate man-land relationships.
507. **World Resources and their Utilization (5).**
 The world's principal natural resources are studied primarily from the geographic point of view (location, transportation, topography, water supply, power sources, climate, etc.)
510. **Geography of Alabama (5).**
 The geographic characteristics of the State.

520. Urban Geography (5). Pr., consent of instructor.

The location, character, and growth of urban centers, with special attention to their interior patterns of land use and cultural development.

560. Geography of Manufacturing (5). Pr., consent of the instructor.

World manufacturing regions with emphasis on the United States. Location patterns of selected industries will be examined from the standpoint of location theory.

GRADUATE**600. Seminar in Cultural Geography (5). Pr., consent of instructor, or graduate standing.**

Designed for intensive study and analysis of selected themes within the broad field of cultural geography.

650. Geography Seminar (5-10). Pr., consent of instructor or graduate standing.

Designed for students in intensive study and analysis of problems in geography.

Geology (GL)

Professor Carrington, *Head*

Assistant Professors Cook, Fouts, Settlemyre, and Taylor

Instructors Nunan and Pierce

101. Introductory Geology I (5). Lec. 4, Lab. 2. All quarters.

The origin and classification of rock-forming and ore minerals. Sedimentary, metamorphic, and igneous processes, and classification of rocks that result from such processes. Rock deformation and mountain building. Not open to students having credit in GL 110.

102. Introductory Geology II (5). Lec. 4, Lab. 2. All quarters.

Geomorphology through study of weathering, mass movement, formation of soils, and the erosional, transportation, and depositional aspects of groundwater, streams, oceans, glaciers, and wind. Not open to students having credit in GL 110.

103. Historical Geology (5). Lec. 4, Lab. 2. Pr., GL 101, GL 102, or 110.

Physical and biological history of the earth, with emphasis on the evolution of life forms.

110. Physical Geology (5). Lec. 4, Lab. 2. All quarters.

An accelerated course in general geology for the student with an interest and/or aptitude in natural sciences. The course includes a survey of the important minerals and rocks with emphasis on the processes that effect their formation and destruction. Origin and classification of geologic structures is also included. Not open to students having credit in GL 101 or GL 102.

115. Geological Field Methods (2). Lab. 5. Pr., GL 110 or consent of instructor. Winter, Spring.

The instruments and methods used in geological field mapping.

205. Paleobotany (5). Lec. 4, Lab. 2. Pr., BI 101, sophomore standing. Fall.

Morphology, anatomy, evolution, and stratigraphy of fossil plants, including microscopic fossils.

206. Invertebrate Paleozoology (5). Lec. 4, Lab. 2. Pr., BI 101, sophomore standing. Winter.

Morphology, classification, and significance of selected genera representative of the diversity of fossil invertebrates, including microscopic fossils.

210. Applications of Paleontology (5). Lec. 4, Lab. 2. Pr., GL 205 and 206, sophomore standing. Spring.

The principles and techniques of paleontology will be considered: fossilization, speciation, evolution, paleoecology, paleogeography, and biostratigraphy.

231. Independent Geological Mapping (2). Lab. 5. Pr., GL 115, sophomore standing. All quarters.

Independent mapping project of limited extent done with the consent and under the direction of a faculty member. A geological map and report must be completed, summarizing the investigation of the area chosen.

301. Mineralogy I (5). Lec. 4, Lab. 2. Pr., CH 103 or equivalent, junior standing. Fall.

Crystal chemistry and crystallography.

302. Mineralogy II (5). Lec. 4, Lab. 2. Pr., GL 301, junior standing. Winter.

Identification, description, and classification of representative minerals and mineraloids.

305. Igneous and Metamorphic Petrology (5). Lec. 4, Lab. 2. Pr., GL 302, junior standing. Spring.

Principles and processes of intrusive and extrusive igneous activity and metamorphism. Description and classification of igneous and metamorphic rocks.

- 401. Sedimentary Petrology (5). Lec. 4, Lab. 2. Pr., GL 302, junior standing. Fall.**
Detailed description and classification of sedimentary rocks, with emphasis on the processes of sediment transportation, deposition and diagenesis in marine and non-marine environments.
- 402. Structural and Geotectonic Principles (5). Lec. 3, Lab. 4. Pr., GL 110 and 115, junior standing. Winter.**
Principles and processes of rock deformation, including description and classification of rock structures and methods of analysis. General history of the development of North America through understanding of plate tectonics and structural developments.
- 411. Stratigraphy (5). Lec. 3, Lab. 4. Pr., GL 210, 401 and 402, junior standing. Spring.**
Descriptive geology pertaining to the discrimination, character, thickness, sequence, age, and correlation of rocks. Particular emphasis on field study of stratified rocks, and on the physical development and history of North America.
- 421. Economic Geology I (5). Lec. 4, Lab. 2. Pr., GL 305 and 402, junior standing. Spring, alternate years.**
The origin and classification of mineral deposits formed by igneous and metamorphic activity. Introduction to methods of prospecting.
- 422. Economic Geology II (5). Lec. 4, Lab. 2. Pr., GL 401, junior standing. Spring, alternate years.**
The origin and classification of mineral deposits formed by surficial processes. Introduction to methods of prospecting.
- 431. Research Methods and Application (1-4). Pr., senior majoring in geology and/or consent of departmental faculty upon receipt of acceptable proposal. All quarters.**
Active participation in some phase of original research under supervision of a senior investigator. Credit evaluation determined by the departmental faculty on the basis of the formal presentation of the problem and the probable method(s) of investigation. May be taken more than one quarter for a maximum cumulative credit of four credit hours.

Courses at Gulf Coast Research Laboratory

The following courses are available during Summer quarters at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi. Application forms must be obtained from the Department of Geology during final registration for the Winter Quarter preceding intended attendance.

- 440. Physical Marine Geology (5). Lec. 2, Lab. 5. Pr., consent of departmental adviser, junior standing. Summer only.**
General introduction to the physical processes resulting in the coastal morphology of Mississippi Sound, emphasizing erosional and depositional effects of waves and currents. Various environmental types (deltas, estuaries, etc.) and their characteristics are studied. Identification of ancient shorelines and ancient environments.
- 441. Chemical Marine Geology (5). Lec. 2, Lab. 5. Pr., consent of departmental adviser, junior standing. Summer only.**
Overview of the chemical systems in the oceans, with special emphasis on near-shore marine and estuarine environments. Basic analytical methods currently used to study the marine environment, with a strong concentration on instrumental methods of analyzing natural waters and sediments. Supervised research on chemical systems in the local estuaries, Mississippi Sound, and offshore.

History (HY)

Professors McMillan, Head, Belser, Harrison, Jones, Lewis, Maehl,
Newton, Owsley, Rea, Reid, and Williamson
Associate Professors Eaves and Reagan

Assistant Professors Bond, Cronenberg, Fabel, Hall, Henson, Kicklighter, and Olliff

- 101. World History (3).**
A survey of world civilization from prehistory to 1400.
- 102. World History (3).**
A survey of world civilization from 1400-1815.
- 103. World History (3).**
A survey of world history from 1815 to the present.
- 201. A History of the United States to 1865 (5).**
- 202. A History of the United States Since 1865 (5).**

204. Technology and Civilization I (3).

The interaction of technology and other aspects of human culture from prehistoric times to the beginning of the industrial revolution.

205. Technology and Civilization II (3).

The interaction of technology and other aspects of human culture from the industrial revolution to the end of the nineteenth century.

206. Technology and Civilization III (3).

The interaction of technology and other aspects of human culture in the twentieth century.

300. Introduction to Latin American History (5). Pr., sophomore standing.

A survey of Latin American civilizations to the present with emphasis on the Colonial Period.

301. Introduction to Far Eastern History (5). Pr., sophomore standing.

A brief survey of the major cultural and institutional developments of the area.

306. Contemporary History (3).

A survey of recent events and their effect on the modern world.

308. Naval History of the United States (3).

The development of the United States Navy from the American Revolution to the present including the evolution of naval technology and strategy and the role of the navy in defense, discovery, and diplomacy.

309. Military History of the United States (3).

History of the United States military policy, strategy, and tactics, 1775 to the present (land warfare).

310. Greco-Roman History (5). Pr., sophomore standing.

A survey of the Classical or Hellenic Civilization from the Homeric Age to the reign of the Emperor Justinian.

311. Medieval History (5). Pr., sophomore standing.

Europe from the fall of the Roman Empire to the Age of Discovery.

315. American Black History to 1900 (5). Pr., sophomore standing.

Racial and cultural origins of the black, including African background, the slave trade, slavery in the New World, emergence of the free black, emancipation of the slaves, Reconstruction, and the involvement of the institution of segregation.

322. The United States in World Affairs (3). General elective. Pr., sophomore standing.

The influence which the United States has exerted in international affairs.

350. History of Political Parties (5). Pr., sophomore standing.

Emphasis is placed on the origin and growth of American political parties from the Federalist era to the present.

355. History of the Iberian Peninsula (5).

A survey of Spanish and Portuguese history from prehistoric to contemporary times.

371. History of the West (5). Pr., sophomore standing.

The development of the West and of its influence on American history.

380. Technology, Society, and the Environment (5). Pr., junior standing.

A study of contemporary social, technological, and environmental problems in historical perspective.

381. History of Alabama (5). Pr., sophomore standing.

A brief history of Alabama from the beginning to the present.

ADVANCED UNDERGRADUATE AND GRADUATE

500. American Colonial History (5).

The political, economic, and social history of the colonies from their founding to the end of the French and Indian War, 1763.

501. The American Revolution and the Confederation, 1763-1789 (5).

The new British Colonial policy, the War for Independence, and the first federal constitution and the movement to replace it.

502. Federalist and Jeffersonian America, 1789-1815 (5).

The establishment of the new federal government, the origins of American political parties, and the role of the United States in the French Revolutionary and Napoleonic Wars.

503. The American System and Jacksonian Democracy, 1815-1850 (5).

Nationalism, sectionalism, egalitarianism, and expansion.

504. The Civil War (5).

The sectional controversy from the Compromise of 1850 to the beginning of hostilities in 1861, and the military, economic, social, and political aspects of the war.

505. The Reconstruction Period (5).

An analysis of the social, economic, and political aspects of the years 1865-1877.

506. United States History, 1877-1914 (5).

The political, economic, diplomatic, social, and cultural development of the United States.

507. **Recent United States History, 1914-1932 (5).**
Political, economic, and social development of the United States.
508. **Modern America, 1932 to the Present (5).**
Political, economic, and social development of the United States.
509. **United States Diplomacy to 1890 (5).**
Chief events in our relationships with foreign powers from the Revolutionary War to 1890.
510. **United States Diplomacy Since 1890 (5).**
The emergence of the United States from a hemispheric power to a total involvement in world affairs.
511. **Social and Intellectual History of the United States to 1876 (5).**
Selected areas of American thought are studied in their social context, ranging from Puritanism to the impact of Darwinism on the American mind.
512. **Social and Intellectual History of the United States Since 1876 (5).**
An examination of major intellectual movements in American society from social Darwinism to Progressivism and its legacy.
513. **The South to 1865 (5).**
The origins and growth of distinctive social, economic, cultural, and ideological patterns in the South with emphasis on period 1815-1860.
514. **The South Since 1865 (5).**
Major trends in the South since the Civil War with emphasis on social, economic, cultural, and ideological development.
515. **American Black History Since 1900 (5).**
An analysis and interpretation of the role of American blacks in the development of the United States in the twentieth century.
516. **Social and Intellectual History of Modern Europe (5).**
An examination of selected topics in social and intellectual history which have shaped modern European cultures.
526. **The Reformation Era, 1500-1600 (5).**
Europe during the Protestant and Catholic Reformations, overseas discovery, and political developments in the age of Charles V., Henry VIII, Elizabeth, and Philip II.
527. **Seventeenth Century Europe (5).**
Emphasis on the Thirty Years' War, Scientific Revolution, overseas colonization, and European political developments in the age of Louis XIV.
528. **Europe, 1715-1789 (5).**
A history of Europe from the Age of Absolutism to the collapse of the Old Regime.
529. **The French Revolution, 1789-1799 (5).**
Background: causes and course of the Revolution in France.
532. **The Genesis of Modern Germany (5).**
A survey of the political, constitutional, and cultural history of Germany to 1740.
533. **Modern German History (5).**
A general history of the German states since 1648.
535. **Napoleonic Europe, 1799-1815 (5).**
The rise and fall of the Consulate and the Empire in France and French hegemony in Europe.
536. **Modern France (5).**
From the Ancien Regime to the present.
543. **History of Europe, 1815-1871 (5).**
European history from the Congress of Vienna through the unification of Germany and Italy.
544. **Europe, 1871-1919 (5).**
Emphasis on Central Europe, Germany, and Italy since unification.
545. **Europe Since 1919 (5).**
Emphasis on the rise of totalitarianism, the Second World War, and the post-war period.
550. **Eastern Asia (5).**
A history of China and Japan in the modern world.
551. **South and Southeast Asia (5).**
The diverse cultures of the Asian periphery emphasizing the impact of the West in the recent period.
552. **The Caribbean Area (5).**
An analysis of the Caribbean as to its geographic, cultural, and strategic importance from 1492 to the present.
553. **South America to 1900 (5).**
The colonial and early national period.
554. **History of Mexico (5).**
An analysis of the unique cultural development of Mexico.
555. **Twentieth Century South America (5).**
A survey of the conflict between tradition and change in a developing continent.

556. History of Modern Russia, 1453-1917 (5).

A detailed history of the Russian nation in the modern era to the dissolution of the Empire.

557. History of the Soviet Union Since 1917 (5).

The territories under the Bolshevik regime from the proclamation of the Bolshevik state to the present time.

571. History of Medieval England (5).

A survey of English origins and institutions to the seventeenth century.

572. History of Modern England (5).

A survey of British history since the seventeenth century.

578. Technology and Society in Pre-Industrial Times (5).

The interplay between technology and other aspects of human culture during selected periods of pre-industrial history, using various methods and approaches.

579. Technology and Society in the Industrial Revolution (5).

Various approaches to the study of the interaction between technology, industry, and society in the United States and other countries during selected periods, normally in the late eighteenth and nineteenth centuries.

GRADUATE**600. Seminar in American History, 1763-1800 (5).****601. Seminar in American History, 1850-1876 (5).****603. Seminar in American History, 1876-1914 (5).****604. Seminar in American History, 1914- (5).****605. United States Far Eastern Diplomacy (5).****606. United States Latin American Diplomacy (5).****607. United States Atlantic Diplomacy (5).****608. American Social and Intellectual History (5).****609. Seminar in the Old South (5).****610. Seminar in the New South (5).****611. Seminar in Black History (5).****629. Historical Methods (5).****633. Seminar in Sixteenth Century Europe (5).****634. The Revolution of 1917-1921 (5). Pr., HY 556.****635. Seminar in European History (5).****636. Colonial Latin America (5).****637. Latin America in the National Period, Revolutionary Movements, and National Developments (5).****638. Seminar in the French Revolutionary and Napoleonic Era (5).****639. Historiography and Theory of History (5).****640. Tudor and Stuart England (5).****641. Eighteenth Century England (5).****644. Seminar in Modern European Diplomacy (5).****650. Archival Internship (10). Pr., HY 628.****699. Research and Thesis. (Credit to be arranged.)****799. Research and Dissertation. (Credit to be arranged.)****READING COURSES**

The following reading courses are offered in order to give the graduate student an opportunity for study in specialized areas and are rigorously supervised by the professors responsible for the fields. Registration is by permission of the department and the major professor.

620. Directed Reading in American History to 1876 (5).**621. Directed Reading in American History Since 1876 (5).****622. Directed Reading in American Diplomacy (5).****623. Directed Reading in American Social and Intellectual History (5).****624. Directed Reading in Latin American History (5).****625. Directed Reading in Far Eastern History (5).****626. Directed Reading in English History (5).**

627. **Directed Reading in European History (5).**
 628. **Directed Reading and Study in Archival Procedures (5).**

Horticulture (HF)

Professors Perkins, *Head*, Amling, Norton, and Orr
 Associate Professors Chambliss, Perry, and Sanderson
 Assistant Professors Dozier, Robinson, and Rymal
 Research Associate Martin

Landscape and Ornamental Horticulture

101. **Introduction to Horticulture (1). Lec. 1. Fall.**
 An orientation course for freshman introducing all fields in Horticulture.
221. **Landscape Gardening (5). Lec. 3, Lec.-Dem. 4. Pr., BI 102.**
 Principles of landscape gardening applied to the development of small home grounds and school grounds. The lecture-demonstration periods are devoted to the study of the identification and use of ornamental plants, landscape drawings, and the propagation and maintenance of ornamental plants.
222. **Trees (5). Lec. 3, Lab. 4. Pr., HF 221 or consent of instructor.**
 Identification, culture and use of ornamental trees in landscape plantings.
223. **Evergreen Shrubs and Vines (5). Lec. 3, Lab. 4. Pr., HF 221 or consent of instructor.**
 Identification, culture, and use of broadleaf and narrowleaf evergreens in landscape plantings.
224. **Plant Propagation (5). Lec. 3, Lab. 4. Pr., BI 102.**
 Basic principles and practices involved in the propagation of horticultural plants.
225. **Flower Arranging (3). Lec. 2, Lab. 2. General elective.**
 Principles and practices of flower arranging for the home.
321. **Deciduous Shrubs and Vines (5). Lec. 3, Lab. 4. Pr., HF 221 or consent of instructor.**
 Identification, culture and use of deciduous shrubs and small trees in landscape plantings.
323. **Greenhouse Environment Control (5). Lec. 4, Lab. 3. Pr., BY 102, HF 224.**
 Principles and practices of construction and utilizing greenhouses for various purposes such as plant propagation, crop production, and research.
325. **Landscape Planning of Home Grounds (5). Lec. 2, Lab. 6. Pr., HF 221.**
 Planning of large and small home grounds.
326. **Landscape Planning of Public Grounds (5). Lec. 2, Lab. 6. Pr., HF 221.**
 Planning of public areas and grounds of public buildings, including general layout, planting and detail treatment of special areas.
327. **Landscape Engineering (3). Lec. 1, Lab. 6. Pr., FY 201 or consent of instructor. Summer.**
 Emphasis on the appreciation of forests for esthetic values as well as for production of various forest products. An evaluation of forest areas for recreational purposes. Consideration of campsite requirements, access and circulation as well as other phases of meeting such need.
328. **Landscape Construction (5). Lec. 2, Lab. 6. Pr., HF 221 or consent of instructor.**
 Investigation of the principles and practices used in the detail design and implementation of a landscape site plan or landscape planting plan. Topics to be covered: drafting, surveying, properties of construction materials, earthwork, drainage, and specifications.
425. **Flower Shop Management (5). Lec. 3, Lab. 4. Pr., HF 225, HF 422, consent of instructor.**
 Principles and practices of flower shop management and floral designing.

ADVANCED UNDERGRADUATE AND GRADUATE

521. **Care and Maintenance of Ornamental Plants (5). Lec. 3, Lab. 4. Pr., BY 306, 309. Winter, odd years.**
 Principles and practices of the care and maintenance of trees and shrubs, including pruning, tree surgery, transplanting, and fertilization.
522. **Floricultural Crop Production (5). Lec. 4, Lab. 3. Pr., HF 323.**
 Floricultural crop production under management in greenhouse and outdoor conditions.
523. **Nursery Management (5). Lec. 3, Lab. 4. Pr., HF 224, BY 306, AY 304. Winter, even years.**
 Principles and practices of the management of a commercial ornamental nursery.

- 524. Planting Design (5). Lec. 3, Lab. 4. Pr., HF 222, 223, 321.**
Principles and practices of the combination and use of ornamental plants in landscape plantings.
- 526. Minor Problems (3-5). May be taken more than once for a total of 15 hours. Pr., consent of instructor.**
Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or green house investigations are made, under supervision of instructors. Graduate credit limited to one quarter.
- 531. Advanced Landscape Gardening (4). Lec. 3, Lab. 4. Pr., BI 101, HF 221, graduate standing.**
Principles and practices applying to the use of ornamental plant material in landscaping. (Selected portions of this course may be offered as a 3 hour credit in the Master of Agriculture program.)
- 532. Controlled Plant Growth (5). Lec. 3, Lab. 4. Pr., AY 304, BY 306, CH 208, HF 323, junior standing.**
Controlling and directing growth of plants by manipulation of the environment and by the use of chemicals.

General Horticulture

- 101. Introduction to Horticulture (1). Lec. 1. Fall.**
An orientation course for freshmen introducing all fields in Horticulture.
- 201. Orchard Management (5). Lec. 3, Lab. 4. Fall and Spring.**
Propagating, planting, pruning, cultivating, fertilizing, spraying, thinning, harvesting, grading, storing and marketing the most valuable fruits and nuts grown in the South.
- 308. Vegetable Crops (5). Lec. 3, Lab. 4. Fall, Winter, Spring.**
Principles and special practices used in production of vegetable crops.
- 340. Industrial Food Preservation Technology (5). Lec. 3, Lab. 4. Pr., consent of instructor or junior standing. Fall, odd years.**
Principles of food preservation as applied to industry. Processes considered include refrigeration, pasteurization, canning, freezing, drying, concentration, fermentation, pickling, salting, irradiation, and the use of food additives.
- 341. Industrial Food Equipment and Processes I (5). Lec. 3, Lab. 4. Pr., consent of instructor or junior standing. Winter, even years.**
Material and structural requirements of food equipment, and basic principles and processes such as heat exchange, refrigeration, evaporation, distillation, homogenization, extraction, filtration, centrifugation, fluid flow and instrumentation.
- 342. Industrial Food Equipment and Processes II (5). Lec. 3, Lab. 4. Pr., consent of instructor or junior standing. Spring, even years.**
Continuation of subject matter of HF 341 with emphasis on unit operations and processes.
- 344. Technology of Jellies and Snack Foods (5). Lec. 3, Lab. 4. Pr., consent of instructor or junior standing. Spring, even years.**
Technology of commercial production of jams, jellies, preserves and snack foods. Includes studies of processing and packaging methods, equipment, grades, standards, and visits to commercial plants.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. Commercial Vegetable Crops (3). Lec. 2, Lab. 2. Pr., HF 308. Fall.**
An advanced course in the production of the major commercial vegetable crops.
- 502. Storage, Packaging and Marketing of Vegetable Crops (3). Lec. 2, Lab. 2. Winter.**
Physiological, pathological, and horticultural principles in storing, packaging, and marketing of commercial vegetable crops.
- 504. Fruit Growing (5). Lec. 4, Lab. 2. Pr., HF 201.**
Production and marketing of commercial tree fruits grown in the South.
- 505. Small Fruits (5). Lec. 4, Lab. 2.**
Principles and practices involved in the production of strawberries, grapes, blueberries, and brambles.
- 506. Nut Culture (5). Lec. 4, Lab. 2. Pr., HF 201.**
Production and marketing of pecans, walnuts, and chestnuts.
- 526. Minor Problems (3-5). May be taken more than once for a total of 15 hours. Pr., consent of instructor.**
Selected problems in either vegetable production, pomology, food technology, or landscape and ornamental horticulture, on which independent library, field, laboratory, or greenhouse investigations are made, under supervision of instructors. Graduate credit limited to one quarter.
- 540. Food Engineering (5). Lec. 3, Lab. 4. Winter, even years.**
Application of physics and engineering principles to food processing operation, instrumentation in food processing, process and equipment development.

- 543. Food Analysis and Quality Control (5). Lec. 3, Lab. 4. Pr., CH 208. Fall, even years.**
Sensory, chemical, and instrumental food analysis and its application to quality control and evaluation of grades and standards.
- 545. Food Chemistry (3). Lec. 3. Pr., CH 207. Spring.**
The chemistry of the important components of foods and changes occurring during processing, storage and handling.

GRADUATE

- 601. Experimental Methods in Horticulture (5). Lec. 3, Lab. 6. Any quarter.**
Purposes of research, discovery, and progress as related to the scientific methods; research programs, horticultural programs, selecting projects, reviewing literature, preparing project outlines, conducting experiments, recording data, analyzing data, and publication of results.
- 602. Seminar (1). May be taken more than once for a maximum of three hours credit. Fall, Winter, Spring.**
- 603. Special Problems in Horticulture (3-5). Credit to be arranged. Pr., graduate standing. Any quarter.**
Selected problems in vegetable production, pomology, food technology, or ornamental horticulture.
- 604. Plant Growth and Development (5). Lec. 4, Lab. 2. Pr., HF 432 or BY 306, consent of instructor. Any quarter.**
Morphological and physiological changes in horticulture plants as induced by growth regulators and their theoretical implications in the improvement of horticultural crops production.
- 605. Nutritional Requirements of Horticultural Plants (5). Lec. 4, Lab. 2. Any quarter.**
Nutritional requirements of horticulture crops and factors affecting these requirements.
- 606. Physiology of Horticultural Products Following Harvest (5). Lec. 3, Lab. 4. Pr., BY 306, graduate standing. Any quarter.**
Physiological changes occurring in fresh fruits, vegetables, and other horticultural plant products after harvest. Methods of studying these changes and factors influencing them.
- 607. Breeding of Horticultural Crops (5). Lec. 3, Lab. 4. Pr., ZY 300, graduate standing. Any quarter.**
An application of genetic principles in the propagation and maintenance of fruit, vegetable, and ornamental crop varieties. The genetic basis of some production problems, and special breeding methods applicable to horticultural crops.
- 699. Research and Thesis. Credit to be arranged. May be taken more than one quarter.**

Industrial Engineering (IE)

Professors Brooks, Head, and Cox

Associate Professors Brown, Herring, Hool, Layfield, Smith, Trucks, Webster, and White
Assistant Professors Boyd, Higginbotham, Maghsoodloo, and Zaloom

- 202. Industrial Engineering Fundamentals (3).**
Introduction to the fundamentals of tools and techniques used in the practice of industrial engineering. The relationships of the sub-disciplines of industrial engineering to the current curriculum and typically encountered problems are explored. Introduction to computer programming and the FORTRAN programming language.
- 300. Computer Programming and Introduction to Information-Decision Systems (3). Lec. 2, Lab. 3. Pr., an introductory knowledge of FORTRAN, MH 265 or concurrently.**
Intermediate computer programming using the FORTRAN programming language with emphasis on mathematical and engineering problems. Included are introductory design considerations for information-decision systems involving computers as a principle data processing device. (Intended primarily for engineering students and not open to students with credit in IE 204.)
- 301. Information Retrieval and Computer Programming (3). Lec. 2, Lab. 3. Pr., IE 202, or IE 204, or knowledge of a computer language.**
An introduction to digital computer programming with emphasis on information retrieval problems using COBOL programming language.
- 305. Information-Decision Systems (3). Lec. 2, Lab. 3. Pr., IE 300.**
Interrelated components of complex management information-decision systems. Design considerations for systems involving computers as a principle data processing device.
- 308. Ergonomics I (4). Lec. 3, Lab. 3.**
The analysis and design of work places and methods through application of ergonomic and methods engineering principles.

- 311. Engineering Statistics I (3). Pr., MH 264.**
Basic probability, random variables and distribution functions.
- 323. Engineering Statistics II (5). Pr., IE 311.**
Distribution functions, tests of hypotheses, estimation, regression and correlation methods and introduction to analysis of variance.
- 327. Engineering Economic Analysis (5). Lec. 4, Lab. 3. Pr., MH 265, EC 200, or equivalent or concurrently.**
The development of principles required in engineering economy studies and other decision-making oriented courses. Topics include interest and interest formula derivations, economic decision criteria, capital budgeting, depreciation methods, tax considerations and cost accounting, economic analysis of the selection and replacement of structures, equipment, processes and methods, break-even analysis and learning curves.
- 333. Engineering Statistics III (4). Pr., IE 323.**
Continuation of IE 323. Included are two-way analysis of variance, χ^2 goodness-of-fit, and statistical quality control. Emphasis is on quality control.
- 335. Linear Programming (4). Pr. MH 163.**
Introduction to linear programming with emphasis on model formulation and solution. Other topics include matrix algebra applied to systems of linear equations, computer solutions, and optimality analysis.
- 384. Data Structures (3). Pr., IE 204 or equivalent.**
Basic concepts of data: Linear lists, strings, arrays, and orthogonal lists. Representation of trees and graphs. Storage structures, allocation, and collection. Multilinked structures. Symbol Tables and searching techniques. Sorting techniques, and generalized data management systems.
- 385. Computer Programming Systems I (3). Pr., IE 204 or IE 300.**
An introduction to the types, relationships, and uses made of computer languages which are grouped under the general name of software, with emphasis on utilities, operating systems, and specialized programming languages.
- 401. Occupational Safety Engineering Fundamentals (3). Pr., junior standing.**
Hazard problems generated in occupational environments and their solution or mitigation through application of quantitative analyses and engineering design principles.
- 402. Systems Analysis for Occupational Safety (3). Pr., IE 401 or concurrently.**
Analysis of safety performance, attribution of cost, identification and analysis of accident potential. Fault-tree analysis. Systems safety and reliability.
- 403. Occupational Accident Prevention (3). Pr., IE 401 or concurrently.**
Design principles and concepts of hazard evaluation analysis relating to operation of industrial facilities.
- 404. Occupational Hygiene Engineering I (3). Pr., IE 419 or consent of instructor.**
An introduction to Occupational Hygiene Engineering with emphasis on workplace environmental quality. Heat, illumination, noise, and ventilation.
- 405. Occupational Hygiene Engineering II (3). Pr., IE 404.**
A continuation of Occupational Hygiene Engineering I. Plant and workplace sanitation, plant waste control, health hazard control, principles of epidemiology.
- 406. Occupational Safety and Health Laboratory (3). Lec. 1, Lab. 6. Pr., IE 403, 405 or concurrently.**
Case histories and problems will be examined for factors proven detrimental to safety and health. Solutions designed to assure non-reoccurrence of these conditions. Solutions to be aided by actual laboratory testing and field trips.
- 408. Ergonomics II (5). Lec. 4, Lab. 3. Pr., IE 308.**
The assessment of human work performance and the establishment of performance standards.
- 415. Operations Research Models (5). Pr., IE 300, 323, IE 335.**
An introduction to operations research and some operations research models. Topics include the concepts of systems design, analysis and optimization, network models, introductory dynamic programming, game theory, queueing theory and an introduction to inventory theory, decision theory or Markov Chains.
- 416. Simulation (3). Pr., IE 305, 323.**
Simulation procedures for solving complex systems analysis problems. Emphasis on random processes, model building, and construction of computer simulation models.
- 422. Production Control Functions I (4). Pr., IE 327, 408 or concurrently.**
Functions of production control; forecasting; inventory analysis; scheduling; dispatching and progress control.
- 425. Production Control Functions II (3). Pr., IE 422, 427 or concurrently.**
Functions of production control; production planning; line balancing; plant location; plant layout; manufacturing processes.
- 427. Operations and Facilities Design I (3). Lec. 2, Lab. 3. Pr., IE 327.**
Design principles and concepts of complex systems. (Should be taken the quarter immediately prior to the taking of IE 428.)
- 428. Operations and Facilities Design II (3). Lab. 9. Pr., IE 417, 424, 427.**
The design of industrial, institutional, governmental and service operations and facilities. (Should be taken during student's final quarter.)

436. Plant Location (3). Pr., IE 315, IE 326, IE 417.

Factors and techniques pertinent to the economic location of industrial plants.

438. Occupational Safety and Health Engineering (5). Pr., consent of instructor or senior standing.

Occupational safety and health problems with emphasis on the role of the industrial engineer in the elimination of physical and environmental hazards. (Not open to Industrial Engineering undergraduates enrolled in the Occupational Safety and Health option.)

490-491-492. Industrial Engineering Problems (1-5). Pr., consent of instructor and department head approval.

Individual student endeavor under staff supervision involving special problems of an advanced nature in Industrial Engineering.

Courses not open to IE majors**201. Industrial Administration (3). Pr., sophomore standing.**

The concepts, techniques, and functions of engineering management.

204. Computer Programming (3). Pr., MH 151 or 162.

Digital computer programming with emphasis on mathematical problems, using FORTRAN programming language. (Not open to students with credit in IE 300.)

220. Applied Statistics (5). Pr., MH 161.

Introduction to probability and statistical methods including descriptive statistics, probability and probability distributions, sampling, estimation, regression, time series, index numbers, ranking, and analysis of variance. Applications to administrative and production-service functions will be emphasized.

302. Production Control Techniques (3). Pr., IE 201 or MN 310.

Planning, scheduling, routing, and dispatching in manufacturing operations. Mechanisms for production control.

310. Motion and Time Study (5). Lec. 4, Lab. 3. Pr., EC 274.

Principles and practices of methods engineering and time study.

316. Electronic Data Processing Systems Design (4). Lec. 3, Lab. 3. Pr., IE 204 or 300 or 301 or equivalent programming capability.

Application of computer and associated data processing equipment to business and administrative and decision systems design.

320. Engineering Economy (5). Pr., MH 161, junior standing.

Practical engineering studies for the economic selection of structures, equipment, processes and methods. (Not open to students with credit IE 325 or IE 326.)

330. Decision Analysis (5). Pr., IE 220 or equivalent.

A quantitative analysis of the decision-making process involving models of certainty, risk, and uncertainty with applications to marketing, production, and administration. (Not open to engineering students.)

410. Engineering Statistics (5). Pr., MH 264 or consent of instructor.

Basic probability, random variables, discrete and continuous distributions, sampling distributions, hypothesis testing, estimation, regression and correlation, one-way analysis of variance, testing goodness of fit. (Not open to students with credit in IE 311 and not open to Industrial Engineering undergraduate students.)

411. Operations Research (5). Pr., MH 266, IE 410 or equivalent or concurrently.

Model construction, linear programming, network models, dynamic models, stochastic models, queueing theory, decision theory and simulation. (Not open to students with credit in IE 314 and not open to Industrial Engineering undergraduate students.)

ADVANCED UNDERGRADUATE AND GRADUATE COURSES**540. Sampling and Survey Techniques (3). Pr., IE 323.**

Theory and application of statistical sampling and survey methods, with emphasis on methods optimization.

541. Applied Industrial Engineering Mathematics (3). Pr., MH 265.

Formulation and solution of differential and difference equations. Solution techniques will include analytical theory, Laplace and Z transforms and computer techniques. Introduction to state variables, matrix algebra and analysis.

542. Advanced Linear Programming (3). Pr., IE 335.

Continuation of IE 315 with emphasis on theory. Revised simplex, dual simplex, parametric programming, decomposition, and applied problems.

543. Inventory Control (3). Pr., IE 333, 415, 422.

Application of quantitative methods to the control of industrial inventories.

550. Search Methods for Optimization (3). Pr., MH 264 or consent of instructor and senior standing.

Single and multivariate search techniques and strategies which are used in finding the optimum of discrete or continuous functions about which full knowledge is not available.

- 553. Dynamic Programming (3). Pr., MH 264.**
The theory and methods of dynamic programming will be presented. Specific applications will be discussed.
- 555. Advanced Computer Programming (3). Pr., IE 204 or 300 or consent of instructor.**
Formal definition and presentation of numeric and nonnumeric problems with solutions in the programming language PL/I.
- 556. International Simulation (3). Pr., IE 416 or consent of instructor.**
An in-depth study of SIMSCRIPT, a powerful programming language well suited to general programming problems and especially designed for discrete event simulation applications.
- 558. Reliability Engineering (3). Pr., IE 333, 415.**
Reliability, maintenance, and replacement, with emphasis on quantitatively descriptive methods to be used for problem solving.
- 559. Operational Control System Design (3). Pr., IE 425.**
The design of operational planning and control systems. Integration of individual systems functions. Concept of total systems optimization.
- 560. Materials Handling Systems (3). Pr., IE 415, 416.**
Quantitative analysis and design of material handling systems. Quantitative methods and case studies.
- 561. Advanced Facilities Design (3). Pr., consent of instructor.**
Quantitative methods used to design production and service facilities are emphasized. Case studies.
- 564. Ergonomics IV (3). Pr., IE 408 or consent of instructor, senior standing.**
The philosophy and techniques of man-machine systems design. Emphasis is placed on proper integration of man into production systems.
- 570. Scheduling: Theory and Applications (3). Pr., IE 411 or 415 or consent of instructor.**
Network based sequencing and scheduling problems. Numerous algorithms are presented for scheduling facilities to achieve one or more of several desirable objectives within precedence and resource constraints. Scheduling areas discussed include projects, assembly lines, flow shops and job shops.
- 571. Continuous Process Control and Dynamics (3). Pr., IE 541.**
Continuous process dynamics and block diagram formulation. Conventional continuous process control and introduction to advanced control topics.
- 572. Engineering of Organization and Management (3). Pr., consent of instructor, senior standing.**
Organizational theory and concepts: the interaction between the individual and the organization.
- 575. Project Management (3). Pr., IE 415 or 417 or consent of instructor.**
Project management and development with primary emphasis on use of operations research methods and cost analysis. Study of the applications of CPM, PERT, and GERT to project management.
- 580. Data Processing Fundamentals (5). Pr., consent of instructor.**
An introduction to business data processing methods and procedures, hardware (primarily electro-mechanical and electronic), and software. Introductory programming using the COBOL language emphasizing business applications. (Not for science and mathematics students.)
- 581. Design of Occupational Safety and Health Administrative Systems (3). Coreq., IE 572.**
The design of administrative systems to carry out the OSH function in industrial, service and governmental organizations.
- 585. Computer Programming Systems II (3). Pr., IE 385, EE 322.**
An introduction to machine-oriented programming systems for digital computers. Emphasis will be placed upon the Assemble Language/360 as well as macro systems and input-output control systems.
- 586. Information Organization and Retrieval (3). Pr., IE 305, 385, and 301 or 555.**
The analysis of information content by statistical, syntactic, and logical methods. Search strategies, matching techniques, and file organization in practical retrieval systems. Evaluation of retrieval effectiveness.
- 587. Formal Theory of Computer Languages (3). Pr., IE 301, 555, 585 or consent of instructor.**
Detailed mathematical models of programming languages: phrase structure languages, particularly context-free languages, and their syntactic analysis with application to translation. An introduction to the principles of compilers.
- 588. Fundamental Algorithms (3). Pr., IE 555, 585.**
An introduction and analysis of algorithms commonly used by computer scientists. Topics include generating functions, sub-routines, coroutines, linear lists, trees, and multilinked structures.

GRADUATE

- 616. Industrial Dynamics (3). Pr., IE 416 or consent of instructor.**
Industrial dynamics based on a systems approach to industrial and related problems, with emphasis on decision-making.

617. **Advanced Simulation Problems (3).** Pr., IE 416 or consent of instructor.
Journal readings of applications simulation and development of procedure to solve large scale, realistic simulation problems.
620. **Advanced Engineering Economy (3).** Pr., IE 327 or consent of instructor.
Engineering and economic aspects of project design and analysis. Advanced treatment is given to the following topics: capital budgeting, financing manufacturing organizations, risk and sensitivity analysis, mathematical programming approach to investment decisions, and forecasting methods including input-output analysis.
621. **Queueing Theory (3).** Pr., IE 323 or 410, MH 265, or consent of instructor.
Mathematical models of queueing, with applications to problems such as materials flow, inventory policy, and service center design. Simulation solutions to queueing networks are considered.
622. **Markov Chains (3).** Pr., IE 415.
Finite and continuous Markov Chains, Poisson and Wiener processes, applications will be discussed.
623. **Time Series (3).** Pr., IE 415.
Stationary stochastic processes, time series analysis with emphasis on spectral density functions and applications will be discussed.
624. **Inventory and Production Control Systems (3).** Pr., IE 425.
Advanced topics in production control and inventory theory. The relationships between production and inventory will be discussed.
625. **Advanced Scheduling Theory (3).** Pr., IE 570.
A survey of models and methodologies in the areas of sequencing and scheduling are presented. Models covered include: the single processor model, parallel processor model, flow shops and job shops. Methodologies covered include: integer and dynamic programming, branch and bound and other enumeration procedures as well as simulation and sampling and search methods.
630. **Advanced Statistical Methods for Engineers I (3).** Pr., IE 323 or equivalent.
Basic concepts of statistical experimental design including randomization methods, analysis of variance methods, mathematical derivation of expected mean squares multiple comparison tests, and the Bonferroni and Franklin algorithm.
631. **Advanced Statistical Methods for Engineers II (3).** Pr., IE 630 or consent of instructor.
Extension of IE 630, with primary emphasis on analysis of variance methods.
632. **Advanced Statistical Methods for Engineers III (3).** Pr., IE 630 or consent of instructor.
Elaboration of basic statistical methods for engineers, with emphasis on a more theoretical study of multiple linear regression and the optimization of multiple linear regression methods.
634. **Non-Linear Programming (3).** Pr., IE 542.
This course covers quadratic programming, separable programming, gradient methods, and integer programming.
640. **Nonparametric Statistics (3).** Pr., IE 323.
The theory and application of several nonparametric and distribution-free statistical methods with emphasis on engineering applications.
642. **Input-Output Analysis (3).** Pr., IE 542 or consent of instructor.
Input-Output analysis for interindustry, industry, and company study. Computational aspects of large scale models. Case studies.
644. **Optimization Theory for Large Systems (3).** Pr., IE 634 or consent of instructor.
Large problems with special structures, decomposition principle, many column problems, relaxation procedures, in linear programming, generalized upper bounding, partitioning procedures, and applications.
653. **Advanced Dynamic Programming (3).** Pr., IE 553.
Advanced topics in the theory and application of dynamic programming. Numerical methods to solve specific types of problems. Case studies.
661. **Queueing Applications (3).** Pr., IE 621 or consent of instructor.
Computer-communication networks based upon queueing theory.
663. **Decision and Game Theory (3).** Pr., IE 323 or 410 or consent of instructor.
Classification of decision problems, Bayes risk, utility theory and its applications, optimal strategies for rectangular games, and use of linear programming in solving zero-sum games.
664. **Management Information Decision Systems (3).** Pr., consent of instructor.
Analysis of organizations for information requirements, information flow, data storage and usage and total information systems.
665. **Advanced Topics in Human Engineering (3).** Pr., IE 564.
Human information processing with particular emphasis on human decision behavior.
670. **Advanced Computation Methods (3).** Pr., consent of the instructor.
Advanced computer languages, pattern recognition, and hybrid computation. This course is designed to keep the graduate student abreast of current ideas in this rapidly expanding field.
671. **Discrete Process Control and Dynamics (3).** Pr., IE 571.
Sampled-data control systems and computer control topics. Representation of discrete industrial processes.

672. **Functional Optimization Theory (3). Pr., IE 415.**
Introduction to functional optimization theory including min-max theory, calculus of variations, pontryagin, maximum principles and applied functional analysis.
675. **Advanced Operating Systems Design (3). Pr., IE 301, 555, 585, or consent of instructor.**
Advanced software design methodology with applications focusing on computer operating systems.
676. **Teleprocessing Systems Software (3). Pr., IE 621.**
An introduction to the theory and methods used in developing telecommunication systems software.
680. **Advanced Topics in Occupational Safety and Health (3). Pr., IE 438 or equivalent. Coreq., IE 631 and 665, or consent of instructor.**
Selected topics including accident proneness, risk taking, and systems safety are pursued at the advanced level. Quantification and modeling are emphasized.
681. **Advanced Occupational Accident Prevention (3). Pr., IE 438 or equivalent or consent of instructor.**
Advanced topics in accident prevention with emphasis on current developments.
687. **Formal Theory of Computer Languages II (3). Pr., IE 587 or consent of instructor.**
An in-depth study of compiler principles including symbol tables, source and object program optimization, semantic analysis, storage organization, and code generation.
688. **Methods of Sorting and Searching (3). Pr., IE 588 or consent of instructor.**
An introduction to the theoretical and practical aspects of searching and sorting via the digital computer. Study of algorithms necessary to create and optimize a sort or search routine.
- 690-691-692. **Industrial Engineering Projects (1-5). Pr., consent of instructor and department head approval.**
Individual student endeavor under staff supervision involving special problems of an advanced nature in Industrial Engineering.
698. **M.I.E. Design Project. Credit to be arranged. May be taken more than one quarter.**
699. **Research and Thesis. Credit to be arranged. May be taken more than one quarter.**
799. **Research and Dissertation. Credit to be arranged. May be taken more than one quarter.**

Journalism (JM)

Professors Simms, Head, Burnett, and Davis
Assistant Professor Logue
Instructor Housel

Freshman English is prerequisite for all courses in journalism

101. **Newspaper Style (1). Required for all journalism majors and minors.**
The AP-UPI Stylebook and common errors in word selection in newspaper writing.
220. **Survey of Communications Media (5). Not to be used for a major or minor in Journalism.**
Operation of a newspaper, history of the press and radio-television newscasts, techniques of reporting, news writing, editing and layout.
221. **Beginning News Writing (3). Pr., JM 101.**
Introduction to news writing, newspaper style, and mechanical practice, supplemented by work on the college newspaper.
223. **Reporting (3). Pr., JM 221; reasonable typewriting skills.**
The technical aspects of reporting and newsgathering methods, supplemented by work on the college newspaper.
224. **Copyreading and Editing (3). Pr., JM 221.**
Methods of editing copy, writing headlines and proof reading.
315. **Technical Journalism (3). Not to be used for a major or minor in Journalism.**
Designed for students in agriculture and home economics. Introduces practices of news coverage and writing, with major emphasis on specialized fields of study.
321. **Newspaper Makeup and Layout (3). Pr., JM 224.**
Typography and design with practice applications in putting together newspaper pages.

- 322. Feature Writing (5). Pr., JM 221 or consent of the instructor.**
Gathering material for the writing of "human interest" and feature articles for newspapers and magazines, with consideration given to the marketing of manuscripts.
- 323. The Community Newspaper (5). Pr., JM 221 and JM 321.**
Methods, problems, and policies involved in editing the community newspaper, as differing from the metropolitan daily.
- 355. Reporting of Political Affairs (3). Pr., PO 210. (Same as PO 355.)**
Instruction and news assignments in political affairs. Credit in PO 355 precludes credit in JM 355.
- 421. Photo-Journalism (5).**
Uses and processes of photography in the newspaper and magazine field. Operation of press cameras and the technique of developing, printing, and enlarging of pictures is provided.
- 422-423. Journalism Workshop (3-3). Pr., JM 223, JM 321, JM 322, consent of instructor.**
A two-quarter course giving practical experience in preparation of newspaper, radio, television, and magazine copy through supervised work with University communication media. The student is expected to work 10 hours per week.
- 425. Journalism Internship (6). Pr., JM 223, JM 321, JM 322, consent of instructor.**
A full-time internship of at least ten weeks with an approved publication, serving as a regular staff member under the direction of the editor.
- 435. Magazine Editing and Production (5). Pr., JM 221.**
Methods and problems of publishing the popular and trade magazine.
- 465. The History and Principles of Journalism (5).**
The development of the American Press, the principles and ideals of modern journalism, and the law of the press and radio.
- 485. Advanced Reporting (3). Pr., JM 422-23 or JM 425.**
Developing and writing news stories under deadline pressure: investigative and interpretive reporting.

Laboratory Technology (LT)

Associate Professor Wheatley
Assistant Professor Kohl

- 101. Orientation (1). Fall, Winter.**
Aims, objectives, and requirements for careers in Medical and Laboratory Technology.
- 301. Hematology (5). Lec. 3, Lab. 6.**
Study, procedures, and examinations of the blood, as recommended by the American Society of Clinical Pathologists.
- 401. Advanced Hematology (5). Lec. 3, Lab. 6. Pr., LT 301.**
Advanced study of blood cells and blood dyscrasias.
- 402. Seminar in Laboratory Technology (3). Pr., LT 301.**
The student reports from the literature on recent advances in the field of laboratory technology.
- 404. Immunology I (5). Lec. 3, Lab. 4. Pr., BY 302, junior standing.**
Theory of immunology and techniques of laboratory tests based on the antigen-antibody reaction.
- 405. Immunology II (5). Lec. 3, Lab. 6. Pr., LT 404, junior standing.**
Theory and techniques of the serological study of human blood and lipid antigens.
- 422. Hospital Laboratory Practice (5). Lab. 15. Pr., LT 301.**
Practice applications of the principles, procedures, and techniques encountered in hospital laboratories.

Law Enforcement (LE)

Assistant Professor Pendergast

- 260. Survey of Law Enforcement (5). Pr., sophomore standing. (Same as PO 260.)**
Introduction to the philosophical and historical backgrounds; agencies and processes; purposes and functions; administration and technical problems; career orientation.
- 261. Criminal Evidence (3).**
Comprehensive analysis of the rules of evidence with particular emphasis on evidence obtained through search, seizure, and arrest.
- 262. Criminal Investigation (5). Pr., sophomore standing.**
Criminal investigation procedures, including theory of investigation, case preparation, specific techniques for selected offenses, questioning of suspects and witnesses, and problems in criminal investigation.

- 335. Criminal Law for Police Officers (3). Pr., PO 209, PO 210, or PO/LE 260.**
Statutory criminal law and criminal court procedures as applicable to the law enforcement function. Considers the impact of statutory law and common law on police procedures and policies. Judicial interpretation of criminal statutes and its relation to police policies are discussed and an analysis is presented of common police procedures, investigative techniques, and functions in the light of criminal statutes.
- 361. Survey of Criminalistics (5). Pr., LE 262, junior standing.**
Survey of scientific crime detection methods; crime scene search, identification and preservation of evidence; lie detection, *modus operandi*; fingerprint identification, and related subjects.
- 363. Police Administration and Organization (5). Pr., junior standing.**
Principles of organization and administration in law enforcement; functions and activities; planning and research; community relations; personnel and training; inspection and control; policy formulation.
- 461. Seminar in Police Problems (5). Pr., LE 363 or LE 464.**
- 464. Internship in Criminal Justice (5-10). Pr., consent of department head and junior standing.**
Internship in an approved law enforcement or correctional agency under supervision of the agency concerned. Written reports on internship required.

Management (MN)

Professors Henry, Head, Alexander, and Allen

Associate Professors Goodwin, Holley, Ledbetter, Myles, and Snow

Assistant Professors Armenakis, Bedeian, Crim, Feild, Giles,

Shannon, J. M. Smith, J. W. Smith, Wieters, and Zmud

- 207. Electronic Data Processing Principles (5). Lec. 3, Lab. 3, Pr., 10 hours math, ACF 211 concurrently.**
Functions and uses of computers and related equipment emphasizing business application using an appropriate programming language.
- 241. Business Law I (4). Pr., junior standing.**
Introduction to law, torts, contracts, agency and personal property.
- 242. Business Law II (4). Pr., MN 241.**
Legal principles concerning real property, sales, negotiable instruments, partnerships, and corporations.
- 307. Business Computer Applications (3). Pr., MN 207.**
Computerizing business applications using a current business language.
- 308. Business Data File Structures (3). Pr., MN 207.**
Data base management techniques, file management techniques, and data structures.
- 310. Principles of Management (5). Pr., junior standing.**
Management functions and the application of management principles in organizations.
- 344. Environmental Law (4). Pr., junior standing.**
Federal, State, and local law on conservation and regulation of environmental matters.
- 346. Human Relations in Management (5). Pr., MN 310.**
Human relations as applied to business organizations.
- 355. Legal Environment of Business (4). Pr., junior standing.**
Legal environment for business operation with emphasis on contemporary legal issues.
- 380. Industrial Management (5). Pr., MN 310, junior standing.**
Modern scientific management as applied in the actual control and operation of industrial enterprises.
- 381. Management Decision Making I (4). Pr., EC 274, MN 207, 310, 10 hours of mathematics, junior standing.**
Various quantitative techniques as aids in managerial decision making under conditions of imperfect knowledge.
- 382. Management Decision Making II (4). Pr., MN 381, junior standing.**
Major topics of mathematical programming as aids in managerial decision making.
- 410. International Business Management (5). Pr., EC 200, 202, MN 310, MT 331, ACF 361, junior standing.**
Management of multinational firm which owns subsidiaries in several countries.
- 415. Small Business Management (5). Pr., MN 310, consent of instructor, senior standing.**
Problems and opportunities of small business management.
- 440. Organization Theory (5). Pr., MN 346, junior standing.**
Organization theory and principles in the management of business operations.

- 441. Organizational Development (3). Pr., MN 346, junior standing.**
Methods used to bring about change in an organization.
- 442. Personnel Management (5). Pr., MN 310, junior standing.**
Management of labor, dealing with selection, training, placement, turnover, payment policies, employee representation, etc.
- 443. Problems in Personnel and Industrial Relations Management (5). Pr., MN 310, consent of instructor, junior standing.**
Contemporary issues and problems concerning the employee-employer relationship. Not open to PIR majors.
- 444. Collective Bargaining and Arbitration (5). Pr., EC 350 and EC 544 or consent of instructor.**
Investigation and analysis of the theory and practice of collective bargaining and arbitration between unions and management. (Credit for EC 445 precludes credit for this course.)
- 445. Personnel and Organizational Research (3). Pr., MN 346, EC 574 or PG 215 or equivalent, MN 442, junior standing.**
Reading, analyzing, and conducting limited research studies in personnel and organizational problems.
- 446. Personnel Administration Legislation (3). Pr., MN 442, junior standing.**
Legal aspects of personnel administration activities.
- 447. Employee Compensation (3). Pr., MN 442, 446, junior standing.**
Factors, philosophy, design, and problems of administration in compensation program.
- 450. Personnel Selection and Placement (3). Pr., EC 474 or PG 215 or equivalent, MN 442, junior standing.**
Factors involved in developing an effective system for selecting, classifying, and placing personnel.
- 451. Manpower Planning, Development, and Appraisal (3). Pr., MN 442, junior standing.**
Theory and practice plus design of managerial systems in these specialties.
- 454. Special Topics in Collective Bargaining and Arbitration (3). Pr., MN 444 or consent of instructor.**
Collective bargaining and arbitration in non-business sector.
- 480. Business Policies and Administration (5). Pr., EC 200, 202, 274, ACF 211, 212, 361, MN 241, 310, MT 331, senior standing.**
Formulation and application of policies and programs pertaining to personnel, production, finance, procurement, and sales in the business enterprise.
- 482. Management Information Systems (5). Pr., MN 310, MN 207.**
Analysis and application of information flow in the business firm.
- 484. Operations Management (5). Pr., MN 380, 382, 482, junior standing.**
Capstone course for INM students. Application of material presented.
- 490. Special Problems (1-10). Pr., consent of instructor, junior standing. May be repeated.**
Investigation and research into problems with special interest for the student.

ADVANCED UNDERGRADUATE AND GRADUATE

- 510. The Process of Management (5). Pr., consent of Director of Graduate Studies School of Business.**
Accelerated course in management concepts, functions and practices.
- 581. Quantitative Methods Foundation (3). Pr., consent of Director of Graduate Studies, School of Business.**
Accelerated course in basic quantitative methods for management.

GRADUATE

- 600. Computers and Information Systems in Management (5). Pr., MN 207, 681, consent of instructor.**
In-depth analysis of computing, data processing, information systems in complex organizations.
- 605. Human Relations in Business Organizations (5). Pr., completion of prerequisites for graduate study in Business, consent of instructor.**
Advanced study of human relations in individual and group interactions within the environment of business organizations. Emphasis on research literature in the field.

- 606. Management Problems (5). Pr., completion of prerequisites for graduate study in Business, consent of instructor.**
Basic administrative problems in business and industry. Managerial controls as applied to administrative and operative functions.
- 607. Managerial Economics (5). Pr., completion of prerequisites for graduate study in Business, consent of instructor.**
Decision theory and criteria for decision-making concerning output, pricing, capital budgeting, scale of operations, investment and inventory control. Attention is also given to concepts of profits, production and cost functions.
- 640. Advanced Organization Theory (5). Pr., MN 440 or equivalent, completion of prerequisites for graduate study in Business, consent of instructor.**
Traditional and contemporary organization theories with emphasis on current research and controversy.
- 649. Management Science (5). Pr., MN 581 or equivalent, completion of prerequisites for graduate study in Business, consent of instructor.**
Application of management science theory to business operations.
- 650. Seminar (1-10). Pr., completion of prerequisites for graduate study in Business, consent of instructor.**
For those students engaged in intensive study and analysis of management problems.
- 681. Deterministic Quantitative Methods (3). Pr., MN 581 or equivalent.**
Deterministic quantitative methods business applications.
- 682. Stochastic Quantitative Methods (3). Pr., MN 681 or equivalent.**
Various quantitative methods applied to management decision-making under conditions of risk and uncertainty.
- 690. Special Problems (1-5). Pr., completion of prerequisites for graduate study in Business, consent of instructor.**
Variable content in the management area.
- 696. Readings in Production and Personnel Management (1-10). Pr., completion of prerequisites for graduate study in Business, consent of instructor.**
General management theories, practices, and functions in industry and business. Also, covers the role of personnel management and human relations.
- 699. Research and Thesis. Credit to be arranged. Pr., completion of prerequisites for graduate study in Business, consent of instructor.**

Marketing and Transportation (MT)

Professors Baker, *Head*, and Horton

Associate Professors Adams and Henley

Assistant Professors Buchanan, Guffey, Harris, Laumer, Magness and Reed

- 331. Principles of Marketing (5). Pr., EC 202.**
A general survey of the field of marketing covering marketing channels, functions, methods and institutions.
- 336. Quantitative Analysis in Marketing (5). Pr., MN 207, EC 274, MT 331.**
An examination of the role of quantitative methods in implementing marketing strategy.
- 337. Fundamentals of Salesmanship (5). Pr., MT 331, junior standing.**
Knowledge and skill requirements for successful selling; the sales process; business and social responsibilities of salesmen.
- 341. Consumer Analysis (5). Pr., MT 331, PG 211, and SY 201, junior standing.**
Analysis of the consumer buying process as it is affected by environmental and institutional forces and development of market strategies which recognize these factors.
- 372. Economics of Transportation (5). Pr., EC 200, junior standing.**
The development of systems of transportation. Analysis of rates and their effects upon Commerce and Industry. Government regulation of transportation agencies.
- 432. Promotional Strategy (5). Pr., MT 331, junior standing.**
Problems of persuasive marketing strategy, problems objectives, methods of implementing these objectives, and the approaches by which the methods might be blended.
- 433. Retail Store Management (5). Pr., MT 331, junior standing.**
Principles and practices in the scientific operation of the retail store. Store location, layout, buying, pricing, and merchandise control.
- 434. Purchasing (5). Pr., MT 331, junior standing.**
Objectives, control, and the direction of industrial purchasing.

- 436. Marketing Research Methodology (5). Pr., MT 331, MT 336, junior standing.**
Methods of scientific research in the field of marketing and their application to the solution of marketing problems.
- 437. Sales Management (5). Pr., MT 331, junior standing.**
Principles and practices of sound organization and administration of sales organization. Includes consideration of sales department organization, selecting, training, compensating, and supervising sales planning, setting up sales territories and quotas.
- 438. Marketing Channel Systems (5). Pr., MT 331, junior standing.**
The nature and role of marketing channels. Major marketing strategy problems such as designing channel objectives and constraints, distinguishing major channel alternatives, and motivating, evaluating, and controlling channel members.
- 440. International Marketing (5). Pr., MT 331, junior standing.**
Adapting the marketing process of the domestic firm to international operations and the institutional structure that exists to service foreign markets and the practice of marketing administration by firms operating within these markets.
- 473. Logistics Management (5). Pr., EC 200, junior standing.**
Fundamentals of logistics in the transportation operations of business and industrial concerns.
- 475. Transportation and Regulated Industries (5). Pr., MT 372 or instructor's approval, junior standing.**
Economic, legislative, and administrative problems related to regulation of transportation and utility rates and services.
- 476. Transport Enterprise Management (5). Pr., MT 372 or instructor's approval, junior standing.**
Economics of motor transportation systems, emphasis on freight and passenger carriers and the highway system.
- 484. Special Studies in Transportation/Logistics (5). Pr., MT 372, 473, 475, 476.**
An intensive readings course designed to allow the student specialized in-depth study within a particular subject area.
- 490. Special Problems in Marketing and Transportation (1-10). Pr., MT 331, 372, senior standing.**
Qualified students conduct investigations of special problems in Marketing and Transportation. (May be repeated for a maximum of 10 hours credit.)
- 498. Marketing Strategy (5). Pr., MT 331 and 25 hours of Marketing.**
An integrative capstone course for marketing majors.

ADVANCED UNDERGRADUATE AND GRADUATE

- 531. Survey of Marketing Management (5). Pr., consent of the Director of Graduate Studies, School of Business.**
An accelerated course in marketing concepts and practices.
- 581. Special Studies in Marketing Research (5). Pr., MT 336, 341, EC 375, MT 436; graduate students, MT 531 or equivalent.**
An intensive course designed to allow specialized in-depth study within a particular subject area.
- 582. Special Studies in Retailing/Merchandising (5). Pr., MT 336, 341, 337, 433; graduate students, MT 531 or equivalent.**
An intensive course designed to allow specialized in-depth study within a particular subject area.
- 583. Special Studies in Promotion (5). Pr., MT 336, 341, 432 and choice of MT 435 or 473; graduate students, MT 531, or equivalent.**
An intensive course designed to allow specialized in-depth study within a particular subject area.

GRADUATE

- 605. Business and Society (3). Pr., MT 531 or equivalent.**
The role of business within society including the relationships and issues existing between business and the social, political and economic environments.
- 632. Marketing Communications (5). Pr., graduate standing.**
A managerial perspective of the marketing communications process.
- 636. Marketing Research: Methodology and Applications (5). Pr., EC 574 or equivalent and graduate standing.**
An examination of accepted marketing research techniques with emphasis on research design, implementation, and data analysis from the point of view of Marketing Management.

- 650. Seminar (1-10). Pr., consent of instructor or graduate standing.**
Intensive study and analysis of marketing and transportation problems.
- 671. Logistics Management (5). Pr., consent of instructor or graduate standing.**
Analysis of major logistics elements within the total system of the firm. A problem-oriented approach is employed in developing a managerial perspective.
- 672. Transport Economics and Public Policy (5). Pr., EC 200—202 or equivalent, and graduate standing.**
An examination of the U.S. transport system and an analysis of public policy issues regarding regulatory objectives and efficiency of resource use in transportation.
- 690. Special Problems (1-5).**
Variable content in the marketing and transportation areas.
- 699. Research and Thesis. Credits to be arranged.**

Materials Engineering (MTL)

Professors Jemian, *Chairman*, Hsu, Kosolapoff, and Maynor
Associate Professors Budenstein, Hall, Slag, and Wilcox

Responsibility for this curriculum, which is described on page 144, rests with the interdisciplinary Materials Engineering Curriculum Committee. Questions should be directed to the Department of Mechanical Engineering which administers the program.

The courses in the field of Materials Engineering (MTL) are described with the courses in the Departments of Chemical Engineering (CHE), Chemistry (CH), Electrical Engineering (EE), Mechanical Engineering (ME) and Physics (PS). These courses are CH 515, CH 516, CHE 575, EE 412, ME 202, ME 304, ME 335, ME 336, ME 337, ME 338, ME 425, ME 435, ME 536, ME 445, ME 446, ME 447, ME 448, and PS 513.

Mathematics (MH)

Professors Burton, *Head*, Ball, Butz, B. Fitzpatrick, P. Fitzpatrick, Haynsworth, Perry, and E. Williams

Associate Professors Baskerville, J. Brown, Coleman, J. Ford,

R. Ford, Hinrichsen, Lindner, Reed, Robinson, Rogers, Thompson, Transue, and Zenor
Assistant Professors S. Brown, Day, Holmes, W. Kuperberg, Robertson, and Wall
Instructors Alster, Gruenhage, K. Kuperberg, Lauer, Murphy, Phillips, and Smith

- 100. Mathematical Insights (5).**
For students in the arts or humanities. The purpose of this course is to give such students insight into the nature of mathematics by engaging them in mathematical thought processes within a suitable elementary framework. Prior credit for any other University mathematics course precludes credit for this course.
- 140. College Algebra (5). Pr., high school geometry, second year high school algebra or departmental approval.**
Algebraic techniques, coordinate geometry, functions and relations and their graphs, and common logarithms. A preparatory course for MH 151, MH 160 and MH 161. However, credit is not allowed for both MH 140 and MH 160.*
- 151. Finite Mathematics (5). Pr., MH 140 or MH 160.**
Selections from elementary combinatorial analysis, probability theory, linear algebra, linear programming. Designed for students in the School of Business and not open, except by special permission of the Department of Mathematics, to students in Engineering or to Mathematics or Physics majors.
- 160. Pre-Calculus With Trigonometry (5). Pr., high school geometry, second year high school algebra or departmental approval.**
The basic analytic and geometric properties of the algebraic and trigonometric functions with heavy emphasis on the latter. A preparatory course for the calculus sequence. Students who need a review of algebraic techniques should take MH 140. However, credit is not allowed for both MH 140 and MH 160.*
- 161. Analytic Geometry and Calculus (5). Pr., MH 140 or MH 160.**
Limits, the derivative, applications of the derivative, antiderivatives; the conic sections.

*This is a non-credit course for students in some scientific and technical curricula.

162-163. Analytic Geometry and Calculus (5-5). Pr., MH 160 and MH 161.

Integrals, the fundamental theorem of calculus, applications of the integral, the calculus of the exponential and logarithmic functions. The calculus of the trigonometric and inverse trigonometric functions, techniques of integration, indeterminate forms, improper integrals.

163L. Calculus Laboratory I (1). Lec. 1, Lab. 1. Coreq., MH 163.

Selected calculus problems will be studied with the computer as an aid.

264. Analytic Geometry and Calculus (5). Pr., MH 163.

A continuation of MH 161-162-163. Infinite series, partial derivatives, multiple integrals.

264L. Calculus Laboratory II (1). Lec. 1, Lab. 1. Coreq., MH 264.

This course will emphasize problems arising in the context of MH 264.

265. Linear Differential Equations (3). Coreq., MH 264.

First and second-order linear differential equations including the solution of such equations by infinite series.

266. Topics in Linear Algebra (3). Pr., MH 163.

Linear spaces, vector spaces, linear transformations, matrices and determinants. Not open to students who have credit for MH 531 or MH 505 or MH 537.

267. Introductory Probability and Statistics (5). Coreq., MH 161.

Designed for students whose fields require a basic knowledge of probability and for those who plan to take upper level courses in probability and statistics. Conditional probability, independence and random variables with emphasis on discrete random variables.

269. Elementary Differential Equations (5). Coreq., MH 264.

Ordinary differential equations with applications. Credit for this course precludes credit for MH 265.

281-282-283. Elementary Mathematics (5-5-3). Pr., sophomore standing.

These courses provide appropriate mathematical insights for elementary school teachers. Emphasis is on the structure of the number systems, the basic concepts of algebra and informal geometry. Open for credit only to students in Elementary Education, except by special permission of the Department of Mathematics.

301. History of Mathematics (3). Pr., MH 163 or departmental approval.

The evolution of modern mathematics from its motivational roots in the physical sciences; the lives and contributions of outstanding mathematicians; the parallel development of mathematics and western culture.

310. Introduction to Calculus of Variations (3). Pr., MH 265 or departmental approval.

Fundamental concepts of extrema of functions and functionals; the simplest problem of the calculus of variations; first and second variations; generalizations of the simplest problem; sufficient conditions; constrained functionals and isoperimetrical problems; general Lagrange problem.

331-332. Introduction to Modern Algebra I, II (5-5). Pr., MH 163.

Sets, mapping, the integers, isomorphisms, and homomorphisms; groups, rings, fields, ideals.

362. Engineering Mathematics I (3). Pr., MH 265.

Fourier Series, partial differential equations, special functions.

491. Special Problems (1-5). Pr., departmental approval, junior standing.

An individual problems course. Each student will work under the direction of a staff member on some problem of mutual interest.

ADVANCED UNDERGRADUATE AND GRADUATE**501. The Calculus of Vector Functions (3). Pr., MH 266 or departmental approval.**

Derivative and integral of vector functions, gradient, divergence, curl, Green's Theorem, Stokes Theorem.

503. Engineering Mathematics II (5). Pr., MH 265.

Complex numbers, functions, mappings, residues, contour integration.

505. Matrix Theory and Applications (5). Pr., MH 266 or MH 531.

Canonical forms, determinants, linear equations, characteristic value problems.

506. Elementary Partial Differential Equations (5). Pr., MH 265 or MH 528.

First and second order linear partial differential equations with emphasis on the method of eigenfunction expansions.

507. Introduction to Celestial Mechanics (5). Pr., departmental approval.

Dynamics of a particle, two-body problems, coordinate transformations, series expansions in elliptic motion, introduction to general perturbation theory.

508. Elements of Numerical Analysis (5). Pr., MH 264.

The numerical solutions of selected problems arising in calculus and algebra along with the programming techniques.

518. Analysis for Applied Mathematics (5). Pr., MH 265, 266.

Linear functions and transformations, concepts of the calculus including uniform continuity and uniform convergence, curves, series of functions, complex differentiation and differential equations. Designed primarily for students in engineering, physical sciences and applied mathematics who are likely to pursue more advanced work. Not open for credit to students in the MH curriculum.

520-521-522. Analysis I, II, III (5-5-5). Pr., MH 264.

The real number system, theorems concerning number sets, sequences, graphs of functions; Riemann-Stieltjes integration, continuity, the derivative and functions of bounded variation; functions whose domains are in Euclidean spaces.

- 524. Fourier Series (3). Pr., MH 264.**
Convergence and oscillation theorems for Fourier Series. Gibbs phenomenon.
- 528-529. Linear Differential Systems (3-3). Pr., MH 522 or departmental approval.**
Systems of linear ordinary differential equations, series solutions, approximate solutions.
- 531. Introduction to Modern Algebra III (5). Pr., MH 332.**
A continuation of MH 331-332
- 537. Linear Algebra (5). Pr., MH 531.**
Linear transformations, matrix algebra, finite-dimensional vector spaces.
- 541-542. Geometry, A Modern View I, II (5-5). Pr., MH 163.**
A development of geometry using the real number system and measurement as proposed by G. D. Birkhoff. The course moves rapidly, with definitions and proofs, through the foundations of geometry and into the main body of geometric theory.
- 543. Linear Geometry (5). Pr., MH 163.**
Transformations in projective, affine, and Euclidean planes.
- 544. Combinatorial Geometry in the Plane (5). Pr., MH 163.**
Helly's and related theorems.
- 550-551. Metric Spaces (3-3). Pr., MH 521 or departmental approval.**
The elementary properties of metric spaces with special attention to the line and the plane.
- 560. Introduction to Numerical Analysis (5). Pr., MH 265 or MH 528; a knowledge of an algorithmic computer language available at the Computer Center.†**
Polynomial approximation, numerical differentiation and integration, solution of ordinary differential equations (initial value problems) error analysis.
- 561. Numerical Matrix Analysis (5). Pr., MH 266 or MH 531; a knowledge of an algorithmic computer language available at the Computer Center.†**
Numerical solution of algebraic equations and of systems of linear equations, solution of boundary value problems, numerical calculation of characteristic values and vectors, error analysis.
- 564. Probability Theory (5). Pr., MH 520 or departmental approval.**
Complete probability fields, probability functions, random variables, convergent sequences of random variables, conditional probability, distribution functions, various applications.
- 567. Mathematical Statistics I (5). Pr., MH 163.**
Descriptive statistics, elementary probability and sampling theory, least squares and correlation.
- 568. Mathematical Statistics II (5). Pr., MH 567.**
Chi-square test, best estimates, small sample theory, analysis of variance, non-parametric methods.
- 585. Fundamentals of Algebra I (5). Pr., one course above MH 163.***
The structure of the integers, factorization of the integers, congruent theory.
- 586. Foundation of Geometry (5). Pr., one course above MH 163.***
Euclidean and non-Euclidean geometries with emphasis given to their logical development from basic assumptions. Some attention given to the history of geometry.
- 587. Fundamentals of Analysis (5). Pr., one course above MH 163.***
Mathematical analysis with emphasis on basic principles and relationships. (Not for majors in science and mathematics.)

GRADUATE

- 602-603. Celestial Mechanics I, II (5-5). Pr., MH 507 or departmental approval.**
Elliptic motion, potentials of attracting bodies, numerical integration and differential correction of orbits, lunar theory, theory of perturbations, Lagrange's method and introduction to canonical variables, the disturbing function, artificial satellite orbit theory.
- 607-608-609. Applied Mathematics I, II, III (5-5-5). Pr., approved graduate standing.**
Scalar, vector, and dyadic fields: equations governing fields; Helmholtz's and Laplace's equations in curvilinear coordinates; separation of variables; boundary conditions and eigenfunctions; Green's functions.
- 610. Special Functions (5). Pr., departmental approval.**
- 613. Tensor Analysis (5). Pr., departmental approval.**
- 620-621. Functions of Real Variables I, II (5-5). Pr., departmental approval.**
Measure theory and Lebesgue Integration.
- 622-623. Functions of a Complex Variable I, II (5-5). Pr., departmental approval.**
Complex numbers; analytic functions; derivatives, Cauchy integral theorem and formula; Taylor and Laurent series; analytic continuation; residues; maximum principle; Riemann surfaces, conformal mapping; families of analytic functions.

†This information can be obtained by taking IE 204.

*Not available to graduate students in the area of science or mathematics.

- 624-625-626. Normed Linear Spaces (5-5-5). Pr., departmental approval.**
Bounded linear transformations and linear functionals on Banach and Hilbert spaces, including conjugate spaces, adjoint operations, self adjoint operators, spectral theory, applications to particular spaces.
- 628-629. Advanced Theory of Differential Equations (5-5). Pr., departmental approval.**
Existence, uniqueness and continuation theorems for ordinary and partial differential equations; nature of solutions. The first quarter will be devoted to ordinary equations, the second to partial differential equations.
- 631-632. Modern Algebra I, II (5-5). Pr., departmental approval.**
Numbers; sets; groups; rings; fields of polynomials; Galois theory.
- 633. Theory of Groups (5). Pr., MH 631.**
Sylow theory, abelian groups, chain conditions.
- 634. Theory of Rings (5). Pr., MH 632 or departmental approval.**
Structure of rings, ideals in commutative rings.
- 635. Abelian Groups (5). Pr., departmental approval.**
An axiomatic development of abelian group theory; decomposition theorems, finitely generated groups, rank, divisible groups, pure subgroups, basic subgroups, ulm factors.
- 637-638-639. Matrices (5-5-5). Pr., MH 537.**
Special types of matrices, reduction to canonical form; function of matrices; readings in current literature.
- 640-641-642. Functional Analysis (5-5-5). Pr., MH 626 or departmental approval.**
Topics in the advanced theory of linear functionals and operators on Banach and Hilbert spaces, chosen to lead students into research work in this field.
- 645-646. Differential Geometry I, II (5-5). Pr., departmental approval.**
Tensor analysis, curves and surfaces in Euclidean space; introduction to Riemannian geometry of n -dimensions.
- 650-651-652. General Topology (5-5-5). Pr., departmental approval.**
An axiomatic development of point-set topology; connectivity, compactness, separability, topological equivalence, well-ordering, inner limiting sets, Cartesian products.
- 653. Dimension Theory (5). Pr., departmental approval.**
The topological study of dimension in separable metric spaces.
- 654-655-656. Point-Set Topology (5-5-5). Pr., MH 652.**
Upper semi-continuous collections, indecomposable continua, metrization problems, inverse limits, other topics.
- 657-658. Euclidean Topology (5-5). Pr., MH 650.**
Topology with emphasis on those areas which distinguish among the polyhedra in Euclidean spaces (e.g., Theory of Retracts).
- 661. Advanced Numerical Analysis (5). Pr., MH 561, and MH 265 or MH 528.**
Numerical solution of partial differential equations.
- 664-665-666. Probability (5-5-5). Pr., knowledge of Lebesgue integration.**
Probability measures, random variables, distribution functions (discrete, absolutely continuous, and singular), expectation, characteristic functions (Fourier transforms), independence, limit theorems, convergence to Poisson and normal distributions, central limit theorem, Stochastic processes and Brownian motion, probability measures on metric spaces.
- 667. Mathematical Statistics III (5). Pr., MH 568 or departmental approval.**
Advanced probability and sampling theory, advanced regression and correlation, analysis of variance, Monte Carlo method, factor analysis.
- 668. Mathematical Statistics IV (5). Pr., MH 667.**
Estimation, experimental design, non-parametric methods, sequential analysis, game theory, linear programming, covariance techniques.
- 670. Uniform Spaces (5). Pr., MH 652 and departmental approval.**
Uniform spaces, uniform topology, uniformly continuous functions, completions of uniform spaces, other topics.
- 673-674-675. Combinatorial Theory (5-5-5). Pr., MH 332.**
Topics of current interest in combinatorial theory to include enumeration theory, systems of distinct representatives, latin squares, quasigroups, block designs, Steiner triple systems, Room squares, and finite geometries.
- 691. Directed Reading in Algebra. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.**
- 692. Directed Reading in Analysis. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.**
- 693. Directed Reading in Applied Mathematics. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.**
- 694. Directed Reading in Geometry. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.**
- 695. Directed Reading in Topology. (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.**

696. **Directed Reading in Matrix Theory.** (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
697. **Directed Reading in Numerical Analysis.** (Credit to be arranged.) Pr., 10 hours of 600 courses in the area.
699. **Research and Thesis.** (Credit to be arranged.) May be repeated for credit.
799. **Research and Dissertation.** (Credit to be arranged.)

Mechanical Engineering (ME)

Professors Vestal, *Head*, Barbin, Bussell, Jemian,

Jones, Maynor, Shaw, Swinson, and Vachon

Associate Professors Cooley, Dyer, Fluker, Goodling, Leppert, Maples, Reece,

Scarborough, Smith, Wilcox, and Yu

Assistant Professors Clement and Ranson

Visiting Lecturer Touloukian

202. **Engineering Materials Science—Structure (3).** Pr., CH 103, PS 220 or 205.
Theories and structures of crystalline and amorphous materials. Bonding, crystal classes, phase equilibrium relationships, diffusion and phase transformations.
205. **Applied Mechanics—Statics (4).** Coreq., MH 264 and PS 220.
Resolution and composition of forces; equilibrium of force systems; friction; second moments.
207. **Strength of Materials I (3).** Pr., ME 205 and MH 264; Coreq., MH 265.
Fundamentals of stress and strain; stress-strain relations; temperature effects; bar with axial force; thinwall cylinders; torsion.
211. **Engineering Methods (2).** Lec 1, Lab. 3. Coreq., PS 222.
Presentation and practices in use of techniques of analysis of engineering models.
301. **Thermodynamics I (4).** Pr., MH 264 and PS 220.
Laws of thermodynamics; energy transformations; properties and relationships among properties; equations of state and simple processes and cycles.
302. **Thermodynamics II (3).** Pr., ME 301.
Thermodynamic analysis of real and ideal cycles, and concepts of compressible fluid flow.
303. **Thermodynamics III (3).** Pr., ME 301.
Property determination, Maxwell's relations, thermodynamics of mixtures, combustion, and chemical equilibrium.
304. **Engineering Materials Science—Properties (3).** Pr., ME 202, 207.
Relationships between structure and properties and the effects of environment. Mechanical properties, plasticity of single and poly-crystals, and properties of composite materials.
308. **Computation Laboratory (3).** Lec. 2, Lab. 3. Pr., MH 265.
Application of analog and digital programming in Mechanical Engineering.
309. **Correlative Experimental Mechanics (2).** Lec.1, Lab. 3. Pr., ME 207.
Theories of failure; determination of stress fields by experimental techniques. Introduction to photoelasticity; strain gages; relation of uni-axial test data to failure envelopes.
310. **Thermodynamics (5).** Winter. Pr., MH 163 and PS 206 or equivalent.
Gases and vapors; cycles; mass and heat transfer. Open to non-Mechanical Engineering students only.
316. **Strength of Materials II (4).** Lec. 3, Lab. 3. Pr., ME 207, 309.
Applications of theory with emphasis on experimental verification; structures consisting of bars subjected to axial force and/or torsion; spherical and cylindrical thin wall pressure vessels; beams and long columns.
321. **Dynamics I (4).** Pr., ME 205; Coreq., MH 265.
Kinematics of points, lines, and rigid bodies; relative motion and coordinate transformations; kinetics; conservation of energy and momentum.
322. **Dynamics II (4).** Pr., ME 212 and 321.
Matrix methods in kinematics; introduction to celestial mechanics; Euler's equations of motion; the inertia tensor; gyroscopic motion.
323. **Dynamics of Machines (4).** Lec. 3, Lab. 3. Pr., ME 207, 306, 322.
Analysis of rotating systems. Dynamic force analysis of mechanisms and complexes of mechanisms. Oscillating systems.
335. **Engineering Materials Science—Physical Metallurgy (4).** Lec. 3, Lab. 3. Pr., ME 304.
Relations between structure and properties of metals. Melting and solidification, crystal structure, dislocation and imperfection theories, alloying, deformation, and transformations.

- 336. Physical Analysis of Materials I (4). Lec. 3, Lab. 3. Pr., ME 335.**
The analysis and interpretation of the structures of materials using optical techniques. Specific physical properties will be measured. Samples will be prepared and processed by the students.
- 337. The Physical Analysis of Materials II (4). Lec. 3, Lab. 3. Pr., ME 336.**
The analysis and interpretation of the structures and properties of materials using special techniques. Diffraction, radiography and various non-destructive test procedures will be employed.
- 338. Phase Diagrams (4). Lec. 3, Lab. 3. Pr., ME 335, CH 412.**
Methods of representing and interpreting phase equilibria. Binary and multicomponent systems. Simpler temperature-composition systems and more complex temperature-pressure-composition systems. Major emphasis on applications. Minor emphasis on phase diagram determination and thermodynamics.
- 340. Fluid Mechanics I (3). Pr., ME 301 and 321; Coreq., ME 207.**
Fluid properties; fluid statics; fluid kinematics; integral forms of conservation laws—applications to exterior and interior flows; dimensional analysis.
- 341. Fluid Mechanics II (4). Pr., ME 207 and 340; Coreq., ME 302, 322.**
Potential theory; vorticity; stream functions; viscous flow; boundary layers; turbulent flow.
- 412. Measurements Laboratory (3). Lec. 2, Lab. 3. Pr., ME 308, 303, 341, 521 and 527.**
The theory and practice of engineering measurements, including treatment of experimental data and the design of experiments.
- 420. Thermal Systems Laboratory (2). Lec. 1, Lab. 3. Pr., ME 412; Coreq., ME 415.**
Selected experiments on thermal systems evaluation.
- 425. Thermodynamics of Materials Systems (4). Pr., ME 301 and ME 338.**
The laws of thermodynamics applied to the stability of materials phases, crystal imperfections, solubility, oxidation, surface and interfacial energy, and transformations.
- 434. Fluid Mechanics and Heat Transfer (5). Pr., ME 310. Spring.**
Mechanics of compressible and incompressible fluids, transmission of heat by conduction, convection, and radiation. Open to non-Mechanical Engineering students only.
- 435. Physical Analysis of Materials III (4). Lec. 3, Lab. 3. Pr., ME 445.**
The evaluation of macroscopic structural features, anisotropic materials properties and the detection and interpretation of flaws. Microscopy, radiography and other nondestructive test methods will be employed.
- 439. Mechanical Engineering Design I (4). Lec. 3, Lab. 3. Pr., ME 323; Coreq., ME 335, 527.**
Design of machine elements for static and dynamic stresses with the emphasis on synthesis and creative design.
- 440. Mechanical Engineering Design II (3). Lec. 2, Lab. 3. Pr., ME 316, ME 439, or departmental approval, senior standing.**
The solution of typical engineering systems problems by group or team effort, requiring the development of skill and co-operation in the use of analysis, synthesis, creative design and optimization.
- 441. Engineering Systems (credit 1-5). Pr., senior standing and departmental approval. May be taken more than one quarter, but total credit may not exceed 10 quarter hours.**
Mechanical Engineering design problems requiring the development of skill in the use of analysis, synthesis and creativeness in the design of engineering systems.
- 444. Design for Hazard Reduction (4). Pr., ME 207, 321.**
Relationships of the mechanics of machinery and the properties of materials which lead to the design principles of hazard reduction in machines and machine systems. Open to non-Mechanical Engineering students only.
- 445. Transformations in Condensed Phases (4). Lec. 3, Lab. 3. Pr., ME 337, 425, and 436.**
Important transformations in both metallic and non-metallic materials with crystalline or glass structures. Structures, mechanisms, distinctive characteristics and applications will be studied. Selected transformations will be studied in the laboratory.
- 446. Theoretical Materials and Engineering (3). Pr., ChE 575 and EE 412; Coreq., PS 513.**
The physical properties of materials in relation to modern theories.
- 447. Mechanics of Engineering Materials (4). Lec. 3, Lab. 3. Pr., CH 516, and ME 448.**
The mechanical properties in relation to structural features of alloys, plastics, ceramic materials and composites under static, dynamic and cyclic service and test conditions. Conditions for the attainment of optimum properties and behavior will be emphasized.
- 448. Introduction to Ceramics (3). Pr., ME 335.**
The engineering applications and design principles of important ceramic materials will be studied with particular attention directed to the structure-property relationships. Both glassy and crystalline ceramic materials will be included.
- 449. Professional Diagnostic Problems (4). Pr., senior standing in any engineering curriculum or departmental approval.**
Problems involving interaction of the different engineering science disciplines, with emphasis on engineering design, synthesis, and systems.

- 450. Special Problems. (Credit 1-5). Pr., department head approval, junior standing.**
Individual student endeavor under staff supervision involving special problems of an advanced nature.
- 451. Advanced Projects (3). Lec. 1, Lab. 6. Pr., ME 421, ME 341; Coreq., ME 440, and senior standing.**
Individual projects of a current nature, involving both analysis and synthesis, culminating in a formal report.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. Statistical Thermodynamics (3). Pr., ME 301 or departmental approval.**
Fundamental laws of thermodynamics and thermodynamic properties from the microscopic point of view.
- 502. Introduction to Optimal Systems (4). Pr., MH 310.**
Application of optimal criteria to engineering problems.
- 510. Power Plant Systems (5). Lec. 3, Lab. 4. Pr., ME 302, senior standing.**
Theory, design, performance and applications of power plant systems.
- 514. Turbomachines (4). Pr., ME 341 or departmental approval.**
Applications of fluid, mechanics to turbomachines, such as pumps, compressors, fluid couplings, control devices, gas and steam turbines.
- 515. Thermodynamics of Power Systems (4). Pr., ME 302, ME 303, ME 341; Coreq., ME 521 or departmental approval.**
Design and analysis of static and dynamic thermal power systems.
- 521. Heat Transfer (4). Pr., ME 340, EE 263, MH 265, or departmental approval.**
Fundamental principles of heat transfer by steady and unsteady conduction, thermal and luminous radiation, boiling and condensation, free and forced convection.
- 522. Transport Processes (3). Pr., ME 521 or departmental approval.**
Transport processes involving mass, momentum, and energy transfer combined with heat and mass transfer in chemical reacting boundary layers.
- 527. Dynamics of Physical Systems (4). Pr., ME 211, ME 323, ME 340.**
Motion of systems represented by first and second order differential equations. Transient types and response of physical systems. Transfer functions.
- 528. Air Conditioning and Refrigeration (4). Pr., ME 302, 521.**
Theory and design of heating, cooling and ventilating systems, and refrigeration systems, including cryogenics.
- 532. Automatic Controls (3). Pr., MH 265, ME 341, 527.**
Control systems fundamentals. Systems analysis techniques. Applications to machine and process control.
- 536. Engineering Materials Science—Ferrous Metallurgy (3). Pr., ME 335.**
Design of ferrous metals following modern theory and practice. Hardenability, alloying deformation, and special purpose steels.
- 542. Computer Aided Design (3). Pr., ME 527 or departmental approval.**
The computer in design. Batch and interactive processing. The use of typewriter and visual display remote terminals in the development and operation of design systems.
- 543. Photoelastic Stress and Strain Analysis (3). Pr., ME 207.**
Theory of the polariscope; two- and three-dimensional model making and preparation; techniques of data collection and photoelectric models and analysis.

GRADUATE

- 604. Advanced Thermodynamics I (3). Pr., ME 303, graduate standing.**
Classical thermodynamics of reactive and nonreactive systems; applications.
- 605. Advanced Thermodynamics II (3). Pr., ME 604.**
Statistical treatment of the laws and properties of thermodynamic systems; applications.
- 608. Advanced Thermodynamics III (3). Pr., ME 605.**
Thermodynamics of nonequilibrium processes.
- 620. Heat Transmission—Conduction (3). Pr., ME 521, MH 362 or departmental approval.**
Formulations and solutions of steady, steady periodic, and unsteady heat conduction problems.
- 621. Heat Transmission—Convection (3). Pr., ME 521.**
General problems of convection, forced convection heat transfer, free convection, thermodynamic boundary layers, condensing and boiling, heat transfer to liquid metals and analysis of heat exchangers.
- 622. Heat Transmission—Radiation (3). Pr., ME 521.**
Fundamental laws of radiation, net radiation methods, configuration factors, radiation through absorbing media, solar, terrestrial and celestial radiation, and thermometry and temperature control.

- 630. Advanced Strength of Materials (3). Pr., ME 316, MH 362 or departmental approval.**
Stress and strain analyses of curved beams and beams on elastic foundations; energy methods; selected topics from the literature; stress and strain analyses in bars of noncircular section subjected to torsion.
- 631. Theory of Elasticity I (3). Pr., departmental approval.**
Theory of stress and strain and stress-strain relations. Laws of balance in momentum, moment of momentum, and energy. Solution by tensor stress function and displacement functions.
- 632. Theory of Elasticity II (3). Pr., ME 631.**
Continuation of solutions by potential functions. Solutions of two dimensional problems by Kolosov-Muskhelishvili methods.
- 633. Experimental Stress Analysis (3). Pr., ME 316.**
Stress analyses by experimental techniques including transmission and scattered light photoelasticity; strain gages, brittle coatings, photoelastic coatings. Moiré patterns are developed.
- 634. Elastic Stability (3). Pr., ME 631 or departmental approval.**
Stability of conservative and nonconservative systems. Buckling of slender bars and thin-walled cross-sections; buckling of plates and shells. Buckling loads by Rayleigh-Ritz, Galerkin, and Kantorovich methods.
- 635. Intermediate Dynamics (3). Pr., ME 340, MH 362.**
Dynamics of particles and systems of particles applied to engineering problems. Work and energy, and impulse and momentum principles. LaGrange's equations and Hamilton's principle.
- 637. Theory of Plates (3). Pr., ME 631.**
Analyses of plates of various shapes under transverse and in-plane loadings with different boundary conditions. Buckling of plates due to in-plane loadings. Introduction to von Karman large deflection theory.
- 638. Theory of Shells (3). Pr., departmental approval.**
Introduction to differential geometry. Development of governing equations for shells under arbitrary loading. Shallow shell theory with applications. Asymptotic method for solution of differential equations in shell theory.
- 639. Variational Mechanics (3). Pr., departmental approval.**
The problem of Bolza, Mayer and LaGrange with fixed and variable end points; Hamilton's principle and LaGrange's equations; energy method; Rayleigh's principle and Rayleigh-Ritz method; Galerkin method; variational methods; applications.
- 640. Fluid Dynamics (3). Pr., MH 362 and graduate standing.**
Navier-Stokes Equations. Exact and approximate solutions. Euler's equations. Continuity. Energy equations. Irrotational flow.
- 641. Boundary Layer Theory (3). Pr., ME 640.**
Hydrodynamic and thermal boundary layers. Prandtl's equations, integral relations and approximate techniques.
- 642. Gas Dynamics I (3). Pr., ME 640.**
Compressible flow equations; isentropic flow; Fanno line flow; Rayleigh line flow; shock waves; high speed flow; internal and external flows; forces on immersed bodies.
- 643. Gas Dynamics II (3). Pr., ME 642 and ME 605.**
Continuation of ME 642 with emphasis on real gas effects and non-equilibrium flow.
- 644. Turbulence (3). Pr., ME 641.**
Analysis of wall-affected and free turbulent flows.
- 660. Structure and Properties of Solids (3). Pr., departmental approval.**
Denominations of structure are considered, via an interdisciplinary approach, from the viewpoint of providing a fundamental insight with respect to the genesis of selected macroscopic properties.
- 661. Corrosion: Fundamentals and Applications (3). Pr., departmental approval.**
Nature and mechanisms of corrosion. Effects of: material-manufacturing methods, construction and environment. Corrosion types and methods of corrosion control.
- 662. Performance of Metals at Elevated Temperatures (3). Pr., departmental approval.**
Fundamental behavior of metals of elevated temperatures. Commercial and experimental types of ferrous and nonferrous alloys and their suitability for elevated temperature applications.
- 663. X-Ray Metallography (3). Pr., ME 335 and MH 362.**
The principles of X-ray absorption and diffraction and application to the study of metals and other crystalline materials.
- 665. Strengthening of Metals (3). Pr., ME 335.**
A treatment of the six basic mechanisms by which metals are strengthened. Emphasis is placed on causative factors and accompanying manifestations.
- 666. Plasticity of Metals (3). Pr., ME 335.**
A quantitative treatment of: the minimization of plastic flow, by means of design consideration, where the phenomenon is associated with deleterious effects; the maximization of plastic flow, by means of material-condition and forming method considerations, where the objective is to form or shape.
- 667. Dislocation Theory (3). Pr., departmental approval.**
The nature and properties of dislocations including crystal structure and imperfections, dislocation geometry in both ideal and real crystals, dislocation configurations, multiplication and interactions with various imperfections, and methods of observation.

675. Planar Mechanisms (3). Pr., ME 323.

Analysis of simple and complex planar mechanisms. Synthesis by finite displacement and infinitesimal motion methods.

676. Spatial Mechanisms (3). Pr., ME 675.

Analysis and synthesis of spatial mechanisms.

677. Selected Topics in Mechanical Design (3). Pr., ME 630 and ME 675.

Dynamic properties of trains of mechanisms; hydrostatic and hydrodynamic lubrication; thermal equilibrium; wear and fatigue problems; design techniques utilizing modern computational facilities.

678. Conceptual Design of Mechanical Systems (3). Pr., ME 440 or departmental approval.

Engineering problem definition; solution set development; selection criteria; optimization techniques; utilization of computational methods in the design of components.

679. Dynamic Systems Design (3). Pr., ME 527 or departmental approval.

Design of time-responsive systems; system modeling and simulation; development of system component requirements; determination of the characteristics of the designed systems.

680. Noise Control in Mechanical Systems (3). Pr., departmental approval.

Sound: its propagation; reflection; absorption; scattering; sources in machinery. Alteration of machine parameters for noise reduction.

681. Design for Optimum Energy Utilization (3). Pr., ME 604 or departmental approval.

Design and selection of energy systems for optimum energy utilization in commercial, industrial, residential and transportation sectors.

682. Environmental Systems Design (3). Pr., ME 604 or departmental approval.

Design of environmental systems for the support of life, for comfort, for control of local environmental envelopes.

683. Solar Energy Utilization (3). Pr., ME 622 or departmental approval.

Measurement and utilization of solar energy for terrestrial applications.

690. Seminar (credit to be arranged). May be taken more than one quarter.**691. Directed Reading in Mechanical Engineering (credit to be arranged). May be taken more than one quarter.****692. Engineering Analysis (3). Pr., departmental approval.**

Study of equilibrium, eigenvalue, and propagation problems of continuous systems. Physical laws and mathematical properties discussed with considerable emphasis on numerical solutions.

699. Research and Thesis (credit to be arranged). May be taken more than one quarter.**799. Research and Dissertation (credit to be arranged). May be taken more than one quarter.****Military Science (MS)****BASIC COURSE****First Year (Freshman)****Military Science I****101. ROTC Orientation; Organization, History, and Mission (1). Lec. 1, Leadership Lab. 1.****102. Defense Establishment for National Security; Factors of National Power and National Objectives (1). Lec. 1, Leadership Lab. 1.****103. Marksmanship Training and Range Firing (1). Lec. 1, Leadership Lab. 1.****104. Leadership Lab (0). 1 hr. Lab. For MS I students enrolled in PE 162, Rifle Marksmanship.****Second Year (Sophomore)****Military Science II****201. Map and Aerial Photo Reading (1). Lec. 2, Leadership Lab. 1.****202. Introduction to Tactics and Operations (1). Lec. 2, Leadership Lab. 1.****203. American Military History (1). Lec. 2, Leadership Lab. 1.****204. Leadership Lab (0). 1 hr. Lab. For MS II students enrolled in HY 309, Military History of the United States.**

Third Year (Junior)**Military Science III****Military Science III (Pr., MS I & MS II or Basic Camp or equivalent training.)****301. Leadership and Management I (3). Lec. 3, Leadership Lab. 2.**

An examination of current behavioral science information relating to leadership with application toward the military environment and contemporary leadership/management problems.

302. Military Team IA (3). Lec. 3, Leadership Lab. 2.

Educational psychology of the instructional process and methods of military instruction; familiarization with the various branches of the Army; combat training of the individual soldier; communication systems; infantry small unit leader's actions in planning, organizing, and executing offensive and defensive combat operations.

303. Military Team IB (3). Lec. 2, Leadership Lab. 4.

Orienteering, physical training, and the platoon in offensive and defensive combat operations; advanced camp orientation/preparation.

Fourth Year (Senior)**Military Science IV****401. Military Team IIA (3). Lec. 3, Leadership Lab. 2.**

Command and staff relationships and functions, organization, mission, and functions of Army Divisions; capabilities and employment of combat, support and service support forces; organization/tailoring of forces for combat.

402. Military Team IIB (3). Lec. 3, Leadership Lab. 2.

Fundamentals of tactical operations; tactical employment of the company team; use of overlay orders; duties and responsibilities of unit commanders and operations officers in combat.

403. Leadership and Management II (3). Lec. 3, Leadership Lab. 2.

Army administration, training management, logistics, unit level operations; military justice; customs of the service. A culmination of all prior instruction as it relates to the responsibilities and obligations of an officer.

404. Leadership Lab (0). 2 hr. Lab.

For advanced course Military Science students not enrolled in ROTC during a quarter because of leave of absence or who have completed all required classroom instruction.

Music (MU)

Professors Hinton, Head, Moore, Rosenbaum, Tamblin, Tyre, and Walls

Associate Professors Bentley, Liverman, L. Morgan, Timberlake

Assistant Professors Alexander, Greenleaf, Howard, Johnian, Smith, and Stephenson,

Instructors Mayfield, Gossett, and McCutchen

Adjunct Assistant Professors Collins, Kendrick, J. Morgan, Wilder, Hollis

100. Music Convocation (0). All quarters. Required of all music students each quarter.

Performance & lectures by faculty, guest artists, and students. Music & music education majors are expected to perform at the teacher's discretion and in accordance with departmental rules.

131-132-133. Material and Organization of Music (5-5-5).

A systematic study of harmony, counterpoint, form and style through the literature of music.

211-212. Service Playing (1).

Hymn playing, modulation, selected anthems and oratorio selections, simple improvisation and transposition.

231-232-233. Material & Organization of Music (5-5-5). Pr., 133.

Continuation of the study of Harmony, Counterpoint, Form and Style in music.

251-252-253. Survey of Music Literature (1-1-1). Lec. and Lab. 3-3-3.

Presentation of instrumental solo, opera and symphonic music, acquainting the student with musical compositions and composers with emphasis on music literature of the past three centuries.

311. Liturgies (3).

Liturgical worship service of Roman Catholic and Protestant churches, plus non-liturgical forms of other Protestant denominations.

312. Hymnology (3).

The musical significance of hymns of the Christian church from the earliest times to the present.

331-332-333. Materials and Organization of Music (5-5-5). Pr., 233.

Continuation of second year systematic study of harmony, counterpoint, form and style through the literature of music.

334-335-336. Counterpoint I-II-III (3-3-3). Pr., MU 233.

I. Strict Counterpoint. Counterpoint in 5 species in 2 or 3 voices concluding with invertible counterpoint. II. Tonal counterpoint. Contrapuntal devices of the 18th Century including double counterpoint and imitation. III. Invention and Fugue. The study and writing of 2 part inventions, canonic treatment, and the 3 voice fugue.

337-338-339. Modern Harmony I, II, III (3-3-3). Pr., 233.

Twentieth century harmonic devices. An integrated approach to understanding contemporary writing with emphasis on original work and analysis of the principal departments from "traditional" harmony.

351-352-353. Music History I-II-III (3-3-3).

Development of music from early times to the present day. Lectures, recorded examples, readings.

361-362-363. Conducting I-II-III (3-1-1). Pr., MU 133, MU 153.

I. Elementary basic baton techniques and introduction to score reading. II. Choral conducting. Elementary course in choral score reading and conducting choir and glee clubs. III. Instrumental conducting. Elementary course in instrumental score reading and conducting band, orchestra and instrumental ensembles.

371. Introduction to Music (3). Open to Elementary Education Majors only.

The understanding of music including an explanation of basic terms, notation, rhythm, tonal system, vocal and piano score readings.

409. Marching Band Techniques (3).

Fundamental methods and procedures of the Marching Band.

414. Care and Repair of Musical Instruments (1). Lec. 1, Lab. 3. Pr., senior standing.

Selection, care and repair of woodwind, brass and string instruments with emphasis on adjustments which should be made by the instrumental director.

415. Organ Literature and Design (3).

Survey of organ literature correlating the forms of compositions and types of organs for which the music was written.

416. Church Music Seminar (3). Pr., MU 311, 312, 361, 362, 415, or 422, or approval of instructor.

The processes of establishing a complete Church Music program. Supervised directing of choral ensemble.

431-432-433. Music Analysis (3-3-3). Pr., MU 253 and MU 233.

Harmonic and structural analysis of smaller instrumental forms: harmonic and structural analysis of the larger polyphonic and homophonic forms.

434-435-436. Music Composition I-II-III (3-3-3). Pr., MU 233.

Analysis, study, and writing of musical compositions in small, compound, and larger musical forms with emphasis on both stylistic and individual creative writing.

442. Vocal Pedagogy (3).

For prospective voice teacher. An intensive study of the materials and methods of voice training. Classification and analysis of teaching repertoire.

443. String Pedagogy (3).

Mechanics of stringed instruments. Teaching methods, schools, and systems. Teaching literature and repertoire. For either violin, viola, cello, string bass or harp.

444. Instrumental Pedagogy (3).

Mechanics of brass or woodwind instruments. Teaching methods and repertoire with emphasis on solo instrumental literature.

445. Theory Pedagogy (3).

Required of seniors majoring in theory and composition. Designed to present the problems of sight-singing, rhythmic dictation, melodic and harmonic dictation, and part writing from a pedagogical viewpoint.

447-448-449. Piano Pedagogy (3-3-3). For prospective piano teachers.

Teaching methods for beginners in private and group instruction. The intermediate and advanced student. Analysis of teaching repertoire. Observation and practical experience.

452. Vocal Literature (3). Pr., junior standing.

Vocal literature from Elizabethan time to the present, including representative European and American repertoire.

454. Instrumental Literature (3).

Analysis and study of orchestral scores and parts from the classic, romantic and modern literature.

455. Opera Literature (3).

Vocal music of the opera from the Baroque to the present time.

457-458-459. Keyboard Literature (1-1-1). Pr., junior standing.

Masterwork for keyboard from the Baroque Period to the present.

ADVANCED UNDERGRADUATE AND GRADUATE**522-523-524. Theory Review (3-3-3). No credit for Applied Theory Composition or Pedagogy Majors.**

Harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.

537-538-539. Orchestration I-II-III (3-3-3). Pr., MU 233.

Ranges, notation, and characteristics of orchestral instruments. Exercises in arranging for combinations of string and wind instruments. Theory and practice of orchestration for full orchestra.

553. Choral Literature (3). Pr., junior standing.

Chronological study of choral music from the Middle Ages to the present including opera, and oratorio with detailed examination of representative works.

GENERAL ELECTIVE COURSES**201. Fundamentals of Music (3).**

Music designed primarily to develop functional piano skills, sight-reading, rhythm and melodic skills.

372. History of Jazz (3).

The growth of Jazz from its African and European roots to current experimentation.

373. Appreciation of Music (3). May not be taken for credit by Music Majors or Minors.

Outstanding composers and compositions. No previous music training required; an orientation in the art of listening.

374. Masterpieces of Music (3). May not be taken for credit by Music Majors or Minors.

Representative musical works of each great period of musical history. No previous music training required.

477-478-479. Music Arranging (3-3-3). By permission.

Project course in arranging various combination from quartet to symphonic band, and arranging for solo and choral groups.

GROUP PERFORMANCE COURSES**121-122-123. University Singers (1 hour credit per quarter). (May be taken with or without credit.)**

A select choral ensemble for study and performance of madrigals, pop music, show tunes, and choral music of the jazz idiom. Open to any Auburn student by audition only.

124-125-126. Concert Band (1 hour credit per quarter).

Members of the Band are selected during the first week of each quarter. A minimum of 4 rehearsal hours per week is required, with extra rehearsals scheduled as necessary. Band members are required to be present at all rehearsals and all public performances. Students enrolled in Concert Band will have the drill portion of Basic Military Training waived. (May be taken with or without credit.)

127-128-129. Orchestra (1 hour credit per quarter.)

Members of the symphonic orchestra are selected by try-outs during the first week of each quarter. (May be taken with or without credit.)

130. Jazz Laboratory Band (1).

A musical ensemble for advanced musicians for the study and performance of music relating to the jazz idiom. By audition only.

221-222-223. Choral Union (1 hour credit per quarter).

Open to any Auburn student by permission of choral director. (May be taken with or without credit.)

224. Marching Band (1 hour credit per quarter). (Fall Quarter only.)

Provides music for athletic contests and half-time shows at football games, various parades, pep rallies, and other campus and off-campus events. During the fall quarter, will rehearse a minimum of 6 hours per week. Physical Education may be waived for members of the Marching Band. In addition, students will have the drill portion of basic military waived when enrolled in Marching Band. See Band Director for details. (May be taken with or without credit.)

227-228-229. Opera Workshop (1 hour credit per quarter).

Open to all students interested in opera, including performance, stage-craft, make-up, conducting, and coaching. A minimum of three hours per week rehearsal or stage-craft is required with extra time scheduled as necessary. (May be taken with or without credit.)

321-322-323. Concert Choir (1 hour credit per quarter).

CONCERT CHOIR is a small mixed chorus for study and performance of serious choral literature; open to any Auburn student by audition only. (May be taken with or without credit.)

324-325-326. Music Ensemble (1 hour credit per quarter). (By permission.)

Primarily for advanced musicians for the study and performance of musical compositions for small instrumental and vocal groups. A minimum rehearsal of three hours per week required. (May be taken with or without credit.) Includes brass, woodwind, percussion, piano & harp ensembles.

327. Piano Ensemble (1 hour credit per quarter). Study through performance of the ensemble literature for keyboard. May be repeated for credit.

Applied Music

Individual instruction is available in voice, piano, organ, strings, woodwinds, harp, brass and percussion. One 1 hour lesson or two half-hour lessons per week.

Students desiring study in applied music must be approved by the Head of the Department of Music before entrance into the course.

080. Applied Music (0). May be repeated.

Individual instruction in instrumental or vocal areas. Rudimentary practice as related to each discipline.

181-182-183. Applied Music (3-3-3).

281-282-283. Applied Music (3-3-3).

381-382-383. Applied Music (3-3-3).

481-482-483. Applied Music (3-3-3).

Individual instruction in instrumental or vocal areas. For Bachelor of Music majors only.

184-185-186. Applied Music (1-1-1).

284-285-286. Applied Music (1-1-1).

384-385-386. Applied Music (1-1-1).

484-485-486. Applied Music (1-1-1).

Individual instruction in instrumental or vocal areas.

187-188-189. Applied Music (1-1-1).

287-288-289. Applied Music (1-1-1).

387-388-389. Applied Music (1-1-1).

487-488-489. Applied Music (1-1-1).

Individual instruction in instrumental or vocal areas. For students in Elementary and Secondary Education, all music minors, and applied music electives.

The amount of credit in Applied Music is based on the following practice schedule:

1 cr. hr.—5 hours weekly practice

3 cr. hrs.—15 hours weekly practice.

APPLIED MUSIC FEES PER COURSE (PER QUARTER) ...\$35.00

This additional fee to be paid at the time of registering for each Applied Music Course of individual instruction. Instruction is available in one hour or two half-hour lessons per week.

CLASS INSTRUCTION IN APPLIED MUSIC

The Music Department offers a number of classes in Applied Music open to Music Majors and Minors and to regularly registered college students who have had previous music training. These classes meet two hours per week and carry one hour credit.

104-105-106. Piano Class (1-1-1). (2-2-2 Lec. and Lab.)

Class instruction and practice in the rudiments of music as applied to piano playing.

107-108-109. Voice Class (1-1-1). (2-2-2 Lec. and Lab.)

Class instruction and practice in the rudiments of music as applied to voice.

110-111-112. String Instruments Class (1-1-1). (2-2-2 Lec. and Lab.)

Class instruction and practice in the rudiments of music as applied to violin, viola, cello and contrabass playing.

113-114-115. Brass Instruments Class (1-1-1). (2-2-2 Lec. and Lab.)

Class instruction and practice in the rudiments of music as applied to playing on trumpet, trombone and other brass instruments.

116-117-118. Woodwind Instruments Class (1-1-1). (2-2-2 Lec. and Lab.)

Class instruction and practice in the rudiments of music as applied to playing on clarinet, oboe, bassoon, flute and other woodwind instruments.

119. Percussion Instruments Class (1). (2 Labs.)

Class instruction and practice in the rudiment of music as applied to playing percussion instruments: drums, bells, cymbals, triangle, tympani, etc.

ADVANCED UNDERGRADUATE AND GRADUATE**522-523-524. Theory Review (3-3-3). Pr., senior standing and departmental approval.**

No credit for Applied, Theory-Composition, or Pedagogy majors. A review of the harmonic techniques of the 18th and 19th centuries, with special emphasis on style and design.

GRADUATE**600-601-602. Advanced Instrumental and Choral Conducting (2-2-2).**

Laboratory for development of skills relating to the performance of traditional and modern works. Emphasis on score reading and analysis.

603. Brass Instruments Techniques (1). Lec. 1, Lab. 3.

Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on brass instruments.

604. Woodwind Instruments Techniques (1). Lec. 1, Lab. 3.

Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on woodwind instruments.

605. Percussion Instruments Techniques (1). Lec. 1, Lab. 3.

Course designed to work out specific problems with graduate students in furthering their knowledge of and skill on percussion instruments.

606. Music in the Arts (4).

Music in relation to architecture, the plastic arts, and poetry.

607. Choral Literature of the Classic, Romantic and Modern Periods (4).

The styles, forms, and performance practices of the choral music from the Classic, Romantic and Modern periods, working primarily with scores of representative works. Participation in an approved choral organization is required.

608. Choral Arranging (4). Pr., departmental approval.

Advanced Arranging for various choral combinations. Participation in an approved choral organization is required.

609. Seminar in 20th Century Music (3-3-3). Pr., departmental approval.

Analysis and comparison of representative works of principal composers of the first half of the 20th century. Specific works chosen for each quarter. (May be repeated for a maximum of 9 hrs. credit.)

610. Band Arranging (4). Pr., departmental approval.

Advanced arranging for various band organizations. Participation in band is required.

611. Orchestral Arranging (4). Pr., departmental approval.

Advanced arranging for various orchestral organizations. Participation in orchestra is required.

612. Acoustics in Music (3). Pr., departmental approval.

The physics of sound as related to music.

634. Music History Seminar (2). Pr., departmental approval.

Different aspects of the history of music. Specific research areas chosen each quarter. (May be repeated for a maximum of 6 hrs. credit.)

644. Repertoire Seminar (2-2-2). Pr., departmental approval.

A comprehensive survey of music literature in the student's major area through analysis & performance. (May be repeated for a maximum of 6 hrs. credit.)

650-651-652. Techniques of Private Instrumental Instruction (2-2-2). Pr., departmental approval.

Analysis of teaching and supervised teaching.

653-654-655. Techniques of Private Instruction in Voice (2-2-2).**660-661-662. Independent Study in Applied Music (3-3-3). Pr., departmental approval.**

Advanced private study and recital.

681-682-683. Independent Study in (A) Composition, (B) Analysis (2-3, 2-3, 2-3). Pr., departmental approval.**697. Qualifying Recital.****Naval Science (NS)****111. Orientation to the Navy and Marine Sciences (2). Lec. 2, Lab 2. Fall.**

Introduction to basic areas of Naval Science including such subjects as: uniforms and insignia, military courtesy, discipline, components and supporting elements of the Navy, logistics, communications, security, Naval Intelligence, oceanographic research.

- 112. Naval Ships Systems I (2). Lec. 2, Lab. 2. Winter.**
Fundamentals of ship design, construction and stability, examination of impaired stability and damage control. Basic introduction to thermodynamics and steamcycle as pertinent to Naval propulsion systems.
- 113. Naval Ships Systems II (2). Lec. 2, Lab. 2. Pr., NS 112. Spring.**
A continuation of NS 112 with special emphasis on shipboard auxiliary systems, basic electricity and new areas of propulsion design to include nuclear and gas turbine engines.
- 211. Seapower and Maritime Affairs (2). Lec. 2, Lab. 2. Fall.**
A seminar course dealing with broad principles, concepts, and elements of seapower and maritime affairs with application to the United States and other world powers.
- 212. Naval Weapons I (2). Lec. 2, Lab. 2. Winter.**
An introduction to weapons systems with emphasis on Naval gunfire support, interior and exterior ballistics; missile flight paths and stabilizations. Study of active and passive sensors and associate command and control systems.
- 213. Naval Weapons II (2). Lec. 2, Lab. 2. Pr., NS 212. Spring.**
A continuation of NS 212 emphasizing gun, missile and underwater battery systems; practical aspects of shipboard application of the various systems.
- 311. Navigation I (3). Lec. 3, Lab. 2. Fall.**
The theory and principles of piloting involving the use of visual and electronic aids.
- 312. Navigation II (3). Lec. 3, Lab. 2. Pr., NS 311. Winter.**
The theory, principles, and procedures of celestial navigation and a study of the Rules of the Road.
- 313. Naval Operations (3). Lec. 3, Lab. 2. Spring.**
Navy tactical formations and dispositions, relative motion, maneuvering board, communications, and tactical plots are analyzed.
- 321-323-333. Evolution of the Art of War (2-2-2). Lec. 2, Lab. 2. Fall, Winter, Spring.**
An examination of forms of warfare practices in order to identify historical continuity and change in the evolution of warfare, demonstrate concepts of strategy, examine great captains and military organizations of history to discover ingredients of their success and explore the impact of historical precedent and technological change on politico-military thought and action.
- 411. Principles of Naval Organization and Management I (3). Lec. 3, Lab. 3. Fall.**
An historical approach to naval organization and management. Examination of various "schools of thought" in management and the principles associated with each.
- 412. Principles of Naval Organization and Management II (3). Lec. 3, Lab. 3. Pr., NS 411. Winter.**
A continuation of NS 411 with special emphasis on naval managerial functions.
- 413. Principles of Naval Organization and Management III (3). Lec. 3, Lab. 3. Pr., NS 412.**
A continuation of NS 412 with special emphasis on the Principles of Naval Organization; Uniform Code of Military Justice; naval personnel administration; group dynamics; special problems in naval leadership.
- 421. Amphibious Warfare (2). Lec. 2, Lab. 2. Fall.**
Amphibious warfare prior to World War II; definition of concept, examination of doctrinal origins, and the evolution of amphibious warfare.
- 422. Amphibious Warfare (2). Lec. 2, Lab. 2. Winter.**
Continuation of NS 421. Amphibious warfare in World War II and the Korean Conflict, and evaluation of tactics and techniques.
- 423. Amphibious Warfare (2). Lec. 2, Lab. 2. Spring.**
Current doctrine and techniques of amphibious warfare. Current structure of Fleet Marine Force and equipment.

Nutrition (NN)

(Interdepartmental Graduate Program)

- 601. Nutrition I. The Macro Nutrients (5). Pr., ADS-CH 419, ZY 424.**
The interrelationships among the energy-furnishing and structural nutrients, including carbohydrates, lipids and proteins. A study of the digestion, absorption, transport and metabolism of these nutrients.
- 602. Nutrition II. The Micro Nutrients (5).**
A continuation of NN 601 with emphasis on the role of vitamins and minerals. A study of the interrelationships of nutrients and hormones. Effects of excesses and deficiencies on the organism.
- 603. Nutrition III. Assessment of Normal and Abnormal Nutritional States (5).**
A continuation of NN 602, with emphasis on assessment of nutritional status of man and animals including an evaluation of standards, the human nutrition survey, clinical problems in nutrition, and hereditary and other disorders in metabolism.
- 604. Experimental Nutrition (3). Lec. 1, Lab. 6. Pr., ADS-CH 419 and BY 401.**
Acquaints the student with the animal feeding experiment as a basis for research in nutrition. Includes balance studies and proximate analysis.

605. Nutrition Seminar (I).

Required of all students in the interdepartmental program in Nutrition. Must be taken three quarters.

606. Directed Readings in Nutrition (3-5).

The development of nutrition as a science and a critical analysis of the classic and current literature in nutrition.

Nutrition and Foods (NF)

Professor Fick

Associate Professors Chastain and Waslien, *Head*

Assistant Professors Debes and Svacha

Instructors Cooper and Kelly

104. Principles of Food Preparation (5). Lec. 3, Lab. 4. Each quarter.

Basic principles underlying the fundamental processes and standards of food preparation.

112. Nutrition and Man (3). Each quarter.

The fundamentals of nutrition and the influence of socio-economic and cultural patterns of man on fulfilling nutritional needs.

204. Meal Management (5). Lec. 4, Lab. 3. Pr., NF 104. Each quarter.

Planning of meals with emphasis on scientific principles of nutrition, aesthetic value, management of time and the food budget on various economic levels.

307. Survey of Dietetics (2). Lab. 1, Lec. 3.

Role and professional conduct of dietitians in various institutions. Open only to students enrolled in the Coordinated Dietetics Program.

318. Nutritional Biochemistry (5). Lec. 4, Lab. 3. Pr., CH 203.

Chemistry of carbohydrates, fats, proteins, vitamins, and minerals applied to human nutrition.

324. Food Preservation (3). Lec. 2, Lab. 2.

Food spoilage mechanisms and their prevention.

356. Food Service Administration (10). Lec. 5. Clinical Experience 15. Pr., NF 204.

The processes of planning, organizing, directing, evaluating and controlling, applied to food service systems. Experiences in cooperating facilities.

358. Community and Family Health (3). Lec. 2, Lab. 2.

Facilities, services and agencies within the community which affect health. Field trips.

362. Problems in Community Nutrition (3). Pr., NF 112, or equivalent

Environmental factors that influence the nutritional level of people.

372. Fundamentals of Nutrition (3). Lec. 3.

Principles of human nutrition and factors influencing food requirements.

382. Principles of Normal Nutrition I (5). Lec. 3, Lab. 4. Pr., NF 318 or equivalent.

Physiological and biochemical bases of nutrient needs of the healthy individual. Methods of assessing nutritional adequacy of the diet.

392. Principles of Normal Nutrition II (5). Lec. 3, Lab. 4. Pr., NF 382.

Continuation of NF 382.

408. Independent or Field Study. 3 to 8 credit hours.

Laboratory or field experiences approved and supervised by a faculty member. May be repeated for a maximum of 8 credit hours.

432. Medical Dietetics (10). Lec. 5. Clinical Experience 15. Pr., NF 392.

Principles of nutrition related to disease. Open only to students enrolled in Coordinated Dietetics Program. Experiences in cooperating institutions.

442. Advanced Medical Dietetics (10). Lec. 3. Clinical Experience 21. Pr., NF 432.

Emphasis on current research in nutrition and its application. Experiences in cooperating facilities.

446. Catering (3). Lec. 2, Lab. 3. Pr., NF 204.

Types of catered food-service functions; planning, pricing, organization, management, equipment and service.

452. Family Nutrition (3). Lec. 3. Pr., NF 112 or equivalent.

Application of the principles of nutrition to family members of all ages.

ADVANCED UNDERGRADUATE AND GRADUATE**502. Diet Therapy (5). Lec. 4, Lab. 2. Pr., NF 392.**

Application of principles of nutrition to various periods of stress and as a therapeutic aid in treatment of disease.

- 516. Quantity Food Preparation (10). Lec. 5. Clinical Experience 15. Pr., junior standing and NF 204.**
Principles of menu planning, preparation and sanitation in institution food service. Use, operation and maintenance of food service equipment. Experience in cooperating facilities.
- 522. Community Nutrition (10). Lec. 5. Clinical Experience 15. Pr., NF 392 or consent of instructor.**
Assessment of community nutritional status and methods used to effect change. Experiences in cooperating facilities.
- 564. Experimental Foods (5). Lec. 2, Lab. 6. Pr., NF 104 and CH 203.**
Effects of variation of ingredients and treatments on quality characteristics of foods. Nutrition problems and practices that exist in a modern society.
- 578. Modern Views of Nutrition (3). Pr., satisfactory course in nutrition.**
Current concepts in nutrition and related fields.
- 588. International Nutrition (3). Pr., satisfactory course in nutrition.**
Nutritional status of world population and local, national, and international programs for improvement.
- 592. Infant and Child Nutrition (5). Pr., NF 392.**
Nutrition requirements for growth from pre-natal life through adolescence.

GRADUATE

- 601. Seminar in Nutrition and Foods (1-5). Each quarter.**
May be taken more than one quarter for a maximum of 5 credit hours.
- 605. Methods of Research in Home Economics (3).**
Research and investigation methods applicable to the various areas of Home Economics. Required of all graduate students in Nutrition and Foods.
- 609. Special Problems in Nutrition and/or Foods. Credit to be arranged (2-5). Pr., consent of instructor. May be taken more than one quarter.**
- 620. Advanced Foods I (5). Pr., NF 464 or equivalent.**
Food quality assessment and chemistry of carbohydrates in foods.
- 621. Advanced Foods II (5). Pr., NF 464 or equivalent.**
Chemistry of fats and proteins in foods.
- 622. Problems in Food Preservation (5). Pr., BY 220 or BY 300.**
Various problems which grow out of advanced study of preservation of foods. These problems are subjects for minor research.
- 623. Readings in Nutrition and/or Foods (5-10). Pr., NF 382, CH 203.**
A critical survey of current literature. May be taken more than one quarter.
- 624. Advanced Human Nutrition I (5). Pr., NF 392, NF 318, or equivalents.**
Carbohydrates, fats and proteins. Consideration will be given to the biochemical and physiological functions of these nutrients and their interrelationships in human nutrition.
- 625. Advanced Human Nutrition II (5). Pr., NF 392, NF 318, or equivalents.**
Vitamins and minerals. Consideration will be given to the biochemical and physiological functions and interrelationships of these nutrients in human nutrition.
- 626. Advanced Human Nutrition II (5). Pr., NF 624 and 625, or equivalents.**
Assessment of human nutritional status. Dietary, biochemical and clinical methods of appraisal, and programs for improvement of status.
- 628. Research Methods in Nutrition (5).**
A course designed to acquaint graduate students with modern laboratory techniques used in Human Nutrition Research.
- 699. Research and Thesis. Credit to be arranged.**
Required of all students under the Thesis Option in any field.

Pharmacy (PY)

Professors Cooper, Dean, Coker, Kochhar, Wilken, and Williams

Associate Professors Barker, Beebe, Darling, Hamrick, Newton,

Tanja, and Thomasson

Assistant Professors Belmonte, Born, Clark, Gibson, Henry, Janer, Shell, and Wilkinson

Instructors Davidson, Huffstutler, and Yates

Adjunct Professors Rehling and Upham

Adjunct Assistant Professors Alexander, Arenstein, Collins, Curry, Dempsey,

Druhan, Garrett, Godsill, Haynes, Herring, Himmelwright,

Hurd, Jenkins, Keith, Lazarus, Lazenby, Lyman, McDuffie, Meadows,

Montgomery, Palacios,

Russell, Strother, and Webb

Adjunct Instructors Abbott, Argo, Franklin, Godfrey,

Parker, Peterson, and Williams

Clinical and Hospital Pharmacy

- 346. Clinical Evaluation of Drug Therapy (3). Lec. 3. Pr., CH 302, Pr., or coreq., ZY 561, PY 347, BY 302.**

Examination of the use and interpretation of clinical laboratory test procedures as applied to monitoring therapy.

- 347. Human Pathology (5). Lec. 5. Pr. or coreq., ZY 561. Pr., CH 302, coreq. PY 346.**

The general mechanisms and language of disease. Special emphasis on pathogenesis of disease to include an understanding of the dynamic nature of disease.

- 447. Therapy of Disease I (3). Lec. 3. Pr., PY 420, 531, coreq., PY 421, 532.**

The combination of pathophysiology, clinical chemistry, pharmacology, biopharmaceutics, etc., for specific diseases. To be presented through use of actual case studies with emphasis on the role of the pharmacist in treatment of patient.

- 448. Therapy of Disease II (3). Lec. 3. Pr., PY 447, coreq., PY 422, 533. Continuation of PY 447.**

- 449. Drug Therapy in Clinical Practice (5). Lec. 3, Clinical Conference 1, Lab. 6. Pr., consent of instructor.**

A clinical clerkship involving the observation of drug effects in patients. Students monitor and evaluate drug action by participating in patient rounds and clinical conferences.

- 450. Autotherapy (3). Lec. 3. Pr., PY 422, 448, 533.**

Introduction to the triage function of the pharmacist. Evaluation of and response to patient illness complaints.

- 451. Hospital Pharmacy (3). Pr., PY 303.**

The development of hospitals, their place in society, importance and place of pharmacy in hospitals, administrative and policy making aspects together with interdepartmental relationships. Field trips to representative hospital pharmacies.

- 452. Hospital Pharmacy Laboratory (1). Lab. 3. Pr., PY 303 and consent of instructor. All quarters. Course may be repeated for a maximum of three credit hours.**

Hospital pharmacy experience is obtained in the environment of participating hospitals. Students are expected to furnish transportation for this elective course.

- 453. Professional Practice (3). Lec. 1, Lab. 6. Pr., 3rd prof. year standing.**

Placement of students in various pharmacy practice environments to increase knowledge of practice options.

- 454. Professional Accessories (3). Pr., PY 303.**

The use and capabilities of non-medical professional items such as clinical thermometers, rubber goods, and accessories, atomizers, surgical dressings, surgical supports, trusses.

- 459. Practice Externship (15-18). Pr., third professional year standing.**

A structured externship experience in various practice environments, including hospital, community, and other settings.

- 495. Special Problems (1-5; maximum of 8). Pr., consent of instructor; may be repeated for a maximum of 8 credit hours.**

GRADUATE

- 608. Advanced Biopharmaceutics (5). Lec. 3, Lab. 6. Pr., consent of instructor.**

The relationship between physical and chemical properties of a drug and its dosage forms and the biological effects elicited following administration together with the relevant pharmacokinetics.

- 609. Institutional Pharmacy (5). Lab. 3. Pr., PY 448, 451 and consent of instructor.**
Comprehensive presentation of pharmacy in hospitals, nursing homes, etc., from the viewpoint of the administrative pharmacist. The responsibilities of the director of pharmacy service in a hospital. Field trips taken and a term project on a current aspect of Institutional Pharmacy is required.
- 610. Colloidal and Interfacial Phenomena (5). Lec. 4, Lab. 3. Pr., CH 408 or equivalent and consent of instructor.**
A study of interfacial and colloidal phenomena of chemical, biological and pharmaceutical significance.
- 680. Graduate Seminar (1). Pr., admission to Graduate School.**
Required of all pharmacy graduate students each quarter.
- 695. Special Problems (2-5 hours). Pr., consent of instructor.**
May be repeated for a maximum of 8 hours.

Medicinal Chemistry

- 316. Modern Methods of Drug Analysis (3). Lec. 2, Lab. 3. Pr., CH 208.**
Theory and application of physical and chemical methods with special emphasis on the use of chromatography, instrumentation, and non-aqueous systems in the analysis of pharmaceutical products.
- 420. Medicinal Chemistry I (5). Pr., CH 302, ZY 561, coreq., PY 531.**
Relationship of biodynamic behavior to the chemical reactivity and physical properties of therapeutic agents. A study of mechanism of action, classification and structure-activity relationships of drugs in terms of their physical and chemical properties.
- 421. Medicinal Chemistry II (4). Pr., PY 420, 531 coreq., PY 532.**
A continuation of PY 420.
- 422. Medicinal Chemistry III (5). Pr., PY 421, 532 coreq., PY 533.**
A continuation of PY 421.
- 495. Special Problems (1-5; maximum of 8). Pr., consent of instructor; may be repeated for a maximum of 8 credit hours.**

GRADUATE

- 620-621-622. Chemistry of Synthetic Drugs (5-5-5) Pr., PY 422 or consent of instructor.**
Historical background, pertinent literature, organic name reactions, nomenclature, relation of chemical structure and physical properties to biological activity, isosterism, metabolite antagonism, enzyme inhibition, and exhaustive consideration of the chemistry and biological activity of the various therapeutic classes.
- 623-624-625. Synthesis of Drugs (5-5-5). Lec. 2, Lab. 9. Coreq. PY 620-621-622 or consent of instructor.**
The principles and techniques of analysis as applied to the various therapeutic classes.
- 626-627. Analytical and Control Methods (5-5). Lec. 3, Lab. 6. Pr., PY 316 or consent of instructor.**
The principles and techniques of analysis as applied to the various therapeutic classes.
- 628. Steroid Chemistry (5). Pr., PY 620 or consent of instructor.**
Structure, determination, chemistry, synthesis and structure relationships of steroids of pharmacological and pharmaceutical importance.
- 629. Alkaloid Chemistry (5). Pr., PY 620 or consent of instructor.**
Structure determination, chemistry and synthesis of alkaloids with emphasis on the alkaloids of pharmacological and pharmaceutical importance.
- 660. Heterocyclic Medicinal Chemistry (5). Pr., consent of instructor.**
The chemical nature and behavior of heterocyclic moieties which are either themselves of medicinal significance or are components possessing therapeutic properties.

Pharmaceutics

- 301. Pharmaceutics I (5). Lec. 4, Lab. 3. Pr. or Coreq.; PY 260.**
Introduction to the prescription, pharmaceutical mathematics, dosage forms, pharmaceutical compounding necessary to the modern practice of pharmacy.
- 302. Pharmaceutics II (5). Lec. 4, Lab. 3. Pr., PY 301.**
Development of a basic knowledge of dosage forms and the principles involved in their formulation, design, preparation and evaluation.
- 303. Pharmaceutics III (5). Lec. 3, Lab. 6. Pr., PY 302.**
Influence of formulation on the therapeutic activity of a drug in a dosage form, emphasizing effects of dosage forms on biological response, physiological factors which may affect the drug contained in the dosage form and the dosage form of the drug itself.

495. **Special Problems (1-5; maximum of 8). Pr., consent of instructor; may be repeated for a maximum of 8 credit hours.**
510. **Advanced Pharmaceutics (3). Pr., PY 303.**
Includes the basic physio-chemical and kinetic aspects which underlie the makeup and subsequent action of pharmaceutical dosage forms.
511. **Elements of Pharmaceutical Manufacturing (5). Lec. 2, Lab. 9. Pr., PY 303, consent of instructor, and third professional year standing. Fall, Spring.**
Manufacturing procedures, operation and principles. In the laboratory selected pilot scale production problems are carried out to completion including control and testing of finished products.
512. **Intravenous Admixtures and Sterile Preparations (3). Lec. 2, Lab. 3. Pr., PY 303.**
Principles involved in the preparation of IV additives and sterile dosage forms in hospitals, clinics, and professional pharmacies.

GRADUATE

601. **Parenteral Preparations (5). Lec. 3, Lab. 6. Pr., PY 303 and consent of instructor.**
Theory, preparation and testing of various medicinal preparations intended for injection into the body. Pharmaceutical principles are applied to problems of filtration, sterilization, isotonicity, hydrogen ion concentration and aseptic techniques.
602. **Tablet Manufacture (5). Lec. 2, Lab. 9. Pr., PY 303.**
Essentials in the manufacture, coating and evaluation of compressed tablets.
603. **Product Development (5). Lec. 3, Lab. 6. Pr., PY 303.**
Formulation, evaluation and control techniques as well as actual manufacture of products of pharmaceutical and cosmetic nature.
604. **Pharmaceutical Literature (1).**
Literature searching techniques, services, abstracting and writing, designed for the beginning graduate student in the pharmaceutical sciences.

Pharmacognosy

GRADUATE

640. **Advanced Pharmacognosy (5). Lec. 3, Lab. 6. Pr., PY 307 or equivalent.**
Comprehensive study of both official and unofficial crude drugs conducted macroscopically and microscopically; techniques of use of camera lucida, microtome and microphotographic equipment; pharmacognosy of previously undescribed drugs.
641. **Advanced Microanalysis (5). Lec. 3, Lab. 6. Pr., consent of instructor.**
Methods of microscopy and microchemistry of natural materials and compounds.
642. **Histology of Medicinal Plants (5). Lec. 3, Lab. 6. Pr., PY 440.**
Microscopic structure of medicinal plants in fresh or preserved state as related to the origin and fate of plant compounds.
699. **Research and Thesis. Credit to be arranged.**

Pharmacology/Toxicology

432. **Chemical Pharmacology Laboratory (1). Lab. 3. Coreq; PY 421 and 532.**
Laboratory exercises to demonstrate drug action, mechanism, and structure-activity relationship.
433. **Chemical Pharmacology Laboratory (1). Lab. 3. Coreq., PY 422 and 533.**
Continuation of PY 432.
495. **Special Problems (1-5; maximum of 8). Pr., consent of instructor; may be repeated for a maximum of 8 credit hours.**
531. **Pharmacology I (5). Pr., ZY 561, CH 302; coreq., PY 420.**
Biochemical and physiological effects, action mechanism, absorption, distribution, biotransformation, excretion, and therapeutic and other uses of drugs.
532. **Pharmacology II (5). Lec. 4, Lab. 3. Pr., PY 420, 531; coreq., PY 421.**
Continuation of PY 531.
533. **Pharmacology III (5). Lec. 4, Lab. 3. Pr., PY 421, 532; coreq., 422.**
Continuation of PY 532.
535. **Toxicology, Pr., ZY 561.**
The etiology, pathology, symptomatology and therapy of the diseases induced by accidental exposure to the common agricultural, industrial, commercial and medicinal agents.
536. **Cellular Pharmacology (5). Pr., PY 533.**
Cytological basis of pharmacodynamics including metabolic energy transformation, protein synthesis, and cellular control systems as related to drug actions.

- 537. Fundamentals of Bionucleonics (3). Lec. 2, Lab. 3. Pr., PY 303, consent of instructor and second professional year standing.**
Theoretical and practical application of trace level radioactivity for research application to pharmacy and allied sciences.
- 538. Pharmaceutical Methodologies (5). Lec. 2, Lab. 9. Pr., CH 302.**
Research principles and techniques utilized in evaluation of drug action, analysis and usage.

GRADUATE

- 630. Toxicological Methods (3). Lec. 1, Lab. 6. Pr., PY 535 or equivalent.**
Techniques applied to the separation and chemical identification of the more common volatile, non-volatile organic and metallic poisons.
- 631-632. Psychopharmacology (5-5). Lec. 4, Lab. 3.—Lec. 3, Lab. 6. Pr., PY 536 for PY 631 and PG 320 or PG 445 for PY 632.**
Effect of neurotropic and psychotropic agents upon reverberatory circuits, chemical transmitters, neural amines, and metabolic energy systems; measures of rate of behavioral change, critique of behavioral screening techniques.
- 633. Bioassay (5). Lec. 4, Lab. 3. Pr., MH 267 and PY 538.**
Statistical basis for design of experiments and analysis of data in pharmacological quantitation.
- 637. Pharmacology Seminar (1-3). May be repeated for a maximum of 3 hrs. credit. Pr., graduate standing.**
- 638. Toxicology Seminar (1-3). Pr., graduate standing.**
Students are expected to present reviews of current literature and case histories. This will be followed with discussion by students and faculty.
- 650-651. Advanced Toxicology (5-5). Lec. 3, Lab. 6. Pr., PY 630 or equivalent.**
The mechanism of action of poisons and antidotes, lethal doses and methods of detection and quantitation of poisons in tissues and body fluids. Practical application of analytic procedures and estimation of poisons in post-mortem and clinical specimens. The student will participate in a minimum of four post-mortem examinations with instructions in proper technique to obtaining specimens for toxicological analyses.
- 652. Forensic Toxicology (3). Pr., consent of instructor.**
This course embraces a summary of medical jurisprudence including the laws governing the practice of forensic toxicology in criminal and civil prosecution. Collection, preservation and chain of evidence, and testimony in courts are stressed.

Pharmacy Administration

- 260. History and Orientation (3). Lec. 3. Pr., PPY or PY.**
Introduction to delivery of health care services with emphasis on the role of the profession of Pharmacy.
- 360. Pharmacy Convocation (0). Third Professional Year Standing.**
Professional topics discussed by visiting lecturers, faculty, and students.
- 361. Pharmaceutical Terminology (2). Pr., first professional year standing.**
Common terms and abbreviations used in the professional and scientific aspects of pharmacy and medicine.
- 464. Pharmacy Jurisprudence (5). Pr., MN 310, 207, PY 303.**
Basic legal and ethical principles of pharmaceutical patient care and their effect on the patient drug use process.
- 465. Pharmacy Operating Systems (5). Lec. 3, Lab. 6. Pr. PY 464.**
Methods of systems and decision analysis applied to problems of optimizing the use of money, equipment, drug products, information and personnel within community and institutional environments.
- 466. Environment of Drug Delivery (3).**
Basic political, legal, social, ethical and economic principles of delivering the drug component of health care to patients.
- 467. Drug Literature and Statistics (3). Lec. 3. Coreq., PY 420, 531.**
Emphasis on how and where to find drug information; most useful current therapeutic and drug literature; design, statistical analysis and interpretation of clinical reports.
- 468. Professional Communications I (3). Lec. 2, Lab. 3. Pr., PY 303.**
The nature, purpose and process of communication for the Health Professional. Interviewing, detailing, advertising, and patient counseling are covered along with patient education and information dissemination.
- 469. Professional Communications II (3). Lec. 2, Lab. 3. Pr., PY 468.**
Continuation of PY 468.
- 470. Public and Professional Relations (3). Pr., second professional year standing.**
Principles of public and professional relations with emphasis on establishing objectives and selecting appropriate communication media for creating favorable relationships with the public and health care programs.
- 495. Special Problems (1-5; maximum of 8). Pr., consent of instructor; may be repeated for a maximum of 8 credit hours.**

- 561. Drug Delivery Systems (5). Pr., second professional year standing.**
Identifying patient drug therapy needs and the means of providing these needs in nursing homes, home health care agencies, health maintenance organization, and similar institutions utilizing the services of a pharmacist in a consultant capacity.
- 562. Drug Utilization Review Processes (3). Pr., PY 533.**
Principles and methods of retrospective review of drug indications, contraindications, warnings, precautions, adverse reaction, dosage and administration to determine conformance to Pharmaceutical Services Committee Standards.
- 563. Public Health (5). Pr., BY 302.**
Epidemiological study of diseases of man. A survey of the public health and preventive medicinal programs of federal, state, local and private agencies is included.

GRADUATE

- 681. Hospital Pharmacy Administration (5). Pr., consent of instructor.**
Administrative and policymaking procedures regarding hospital economics, planning, staffing, communications, directing, controlling, design of facilities and operations. Provides an understanding of the socio-economic aspects of hospital pharmacy practice and competence in selected administrative skills needed by administrative pharmacists.
- 682. Research Methodology in Health Science (3). Pr., BY 315 or equivalent or consent of instructor.**
Description and application of the scientific methods of research problems unique to health field, including problem formulation, operational definitions, hypotheses, validity, reliability, research design, data collection by observation, questionnaires, and interviews; cost effectiveness analysis clinical drug investigations, critique research.
- 683. Research Design in Health Science (5). Pr., BY 315 or equivalent, PY 682.**
Design and analysis of research problems in the health care field. The role of operational definitions, concept and construct linkage, hypotheses, and control in casual or covering designs.
- 684. Medication Information Systems (3). Pr., PY 465 or consent of instructor.**
Design and control of planning information systems used to implement medication orders and review the medication distribution system.

Philosophy (PA)

Professor Andelson

Associate Professors McKown, Head, and Davis

Assistant Professors Bole, Brown, Pancheri, and Walters

- 202. Ethics and Society (5).**
A brief outline of the scope and methodology of social ethics, followed by a critical survey of some ethical systems.
- 210. Introduction to Philosophical Problems (3).**
An introduction to the methods of philosophical inquiry and an examination of selected philosophical topics.
- 211. Introduction to Deductive Logic (3).**
The analysis and criticism of arguments, the formulation of principles of deduction and selected philosophical problems of logic.
- 212. Introduction to Scientific Reasoning (3).**
Inductive techniques of hypothesis formation, and a discussion of such related problems in the theory of knowledge as perception, causation, and confirmation.
- 214. Introduction to Ethics (3).**
An inquiry into and evaluation of types of ethical theory and schools of moral philosophy.
- 216. Philosophies of Man (3).**
Fundamental conceptions of man emphasizing the recurring problems of human freedom, intelligence, immortality, and the relationship of man and woman in society.
- 218. Ethics and the Health Sciences (5).**
Topics such as contraception, abortion, and eugenics; human experimentation; truth in drugs and medicine; death and dying; and other health related issues in order to clarify relevant ethical considerations and to provide philosophical bases for decisions on right and wrong, good and bad, rights and responsibilities.
- 305. Aesthetics (5).**
Major aesthetic theories from Plato to modern thinkers.
- 330. Philosophy of Religion (5).**
The philosophical investigation of such topics as the nature of religious language and religious knowledge, the existence of God, the human soul, and the problem of evil.
- 333. History of Philosophy I. Ancient and Early Medieval (5).**
A survey of philosophic thought from the Pre-Socratics through Aquinas, with emphasis on Plato and Aristotle.

- 334. History of Philosophy II. Late Medieval and Early Modern Philosophy (5).**
A survey of philosophic thought from Occam to Kant with emphasis on the major thinkers of the modern period.
- 335. History of Philosophy III. Recent and Contemporary Philosophy (5).**
An examination of some representatives of the major trends in the philosophy of these periods.
- 370. Symbolic Logic (5).**
Propositional logic through the logic of relations, and considerations of philosophical problems of formal logic.
- 380. Pragmatism (5).**
Emphasis on Peirce, James, and Dewey. Some philosophical issues examined from a pragmatic viewpoint.
- 401. Philosophical Foundations of Communism (5). Pr., junior standing.**
The origin, structure, and content of the thought of Marx-Engels and of their early disciples, Kautsky, Bernstein, and Lenin.
- 402. Existentialism (5). Pr., junior standing.**
Selected works of such authors as Kierkegaard, Nietzsche, Sartre, Jaspers, and Heidegger.
- 432. Process Philosophy (5). Pr., junior standing. Alternate years.**
An examination of selected writings of Bergson, Peirce, James, and Whitehead.
- 440. Contemporary Marxism (5). Pr., junior standing.**
An examination of selected writings of Lukacs and Stalin, Merleau-Ponty and Sartre, Habermas, Marcuse, and others.
- 455. Metaphysics (5). Pr., junior standing.**
A critical analysis of such topics as monism and pluralism, freedom and determinism, realism and nominalism, and the mind-body problem.
- 460. Epistemology (5). Pr., junior standing.**
The origin, nature, kinds, and validity of knowledge, with a consideration of faith, intuition, belief, opinion, certainty, and probability.
- 470. Plato (5). Pr., junior standing.**
Plato's epistemology, metaphysics, ethics, and political theory; his relationship to Socratic method and thought.
- 475. Aristotle (5). Pr., junior standing.**
Aristotle's epistemology, metaphysics, ethics, and psychology; his relationship to his predecessors, and his role in Western thought.
- 482. British Empiricism (5). Pr., junior standing.**
Seventeenth and eighteenth century development of empiricism with emphasis on Locke, Berkeley, and Hume.
- 484. Continental Rationalism (5). Pr., junior standing.**
The works of Descartes, Spinoza, and Leibniz.
- 498. Readings in Philosophy (1-10). Pr., junior standing, a 2.5 average in relevant prior work either in philosophy or in related areas and consent of department head and instructor. May be repeated for credit.**
Specific reading programs may be developed which pertain to a particular philosopher, period or problem. A paper and an examination will be expected.

ADVANCED UNDERGRADUATE AND GRADUATE

- 504. Modern Ethical Theories (5).**
Recent analyses of the meanings, presuppositions, and problems of ethical terms and judgments.
- 513. Phenomenology (5). Alternate years.**
The phenomenological method and its application in the works of William James, Husserl, Heidegger, Sartre, and Merleau-Ponty.
- 515. Philosophy of Science (5).**
An analysis of such topics as empirical meaning, verifiability, measurement, probability, causality, and determinism.
- 580. Analytic Philosophy (5). Alternate years.**
The development of philosophical analysis in the twentieth century from G. E. Moore through the Oxford analysts.
- 590. Kant and Transcendental Idealism (5).**
The philosophy of Kant in particular but also of the early Fichte and Schelling and of neo-Kantians.
- 591. Hegel and Absolute Idealism (5).**
The philosophy of Hegel in particular but also of the late Fichte and Schelling, of neo-Hegelians, and of Schopenhauer and other critics.
- 592. Philosophy of Law (5). Alternate years.**
The nature and function of law, including such topics as judicial reasoning, the ground of authority, natural law, legal responsibility, punishment, civil disobedience, and the relation of law to ethics and the behavioral sciences.

GRADUATE

650. **Seminar (1-10). Pr., consent of instructor. May be repeated for credit.**

The content will change for each quarter in any one calendar year. This will vary from movements of thought to an intensive study of one of the great thinkers such as Plato or Whitehead.

Physical Science (PHS)

Associate Professor Ward

Assistant Professor Simon

100. **Physical Science for Elementary Education I (5). Lec. 4, Lab. 2. Open only to students in elementary education. Credit in PHS 100 and 101 precludes credit in PHS 151 and 152.**

Basic concepts in physics, chemistry, astronomy, and earth science developed by lecture and laboratory experience to give students in elementary education a broad background of knowledge and understanding on which to build their own continuing programs of teaching and learning.

101. **Physical Science for Elementary Education II (5). Lec. 4, Lab. 2.**

Continuation of PHS 100.

151. **Introduction to Physical Science I (5). Lec. 3, Rec. 2. Credit in PHS 151 and 152 precludes credit in PHS 100 and 101.**

General physical science for non-science students. The nature of the physical world on both the microscopic and macroscopic scales, how things work, frames of reference, operational definitions, the "scientific method," energy and its transformations, and items of current interest such as radiation, space, and ecology.

152. **Introduction to Physical Science II (5). Lec. 3, Rec. 2.**

Continuation of PHS 151.

ADVANCED UNDERGRADUATE AND GRADUATE

530. **Modern Concepts in Physical Science I (5). Lec. 4, Lab. 3. Pr., PHS 101 or PS 206, or consent of instructor, junior standing.**

General physical science based on IPS materials designed to acquaint the student with the IPS approach.

531. **Modern Concepts in Physical Science II (5). Lec. 4, Lab. 3. Pr., PHS 101 or PS 206, or consent of instructor, junior standing.***

A survey of physics topics using PSSC and Project Physics materials designed to acquaint the students with these approaches to high school physics.

532. **Nuclear Science for Teachers (5). Lec. 4, Lab. 3. Pr., a course in general physics and preferably one in chemistry plus junior standing, junior or senior high school teacher, or approval of instructor.***

A course in the fundamentals of atomic and nuclear structure, designed for junior and senior high school teachers, including the study of radioactivity and nuclear radiation, radiation detection, radiological safety, nuclear fission and fusion, nuclear power reactors and power generation, advantages and hazards of nuclear power reactors.

*Not available to graduate students in the areas of science or mathematics.

Physics (PS)

Professors Carr, Head, Alford, Askew, Fromhold, and Latimer

Associate Professors Budenstein, Clothiaux, French, Kinzer, and Ward

Assistant Professors Chen, Cooper, Fukai, Simon, Thaxton, and Williams

Instructor Burdette

200. **Foundations of Physics (5). Credit in PS 220 and 205 precludes credit for this course.**

The basic principles of mechanics, heat, light, sound, electricity and magnetism and selected topics. For students in agricultural and industrial arts education, industrial design, and home economics.

205. **Introductory Physics—Mechanics, Heat and Sound (5). Lec. 4, Lab. 3. Pr., MH 160.**

The first half of a two-quarter course in the fundamentals of physics. The quantitative as well as the qualitative aspects of the subject are stressed. For students in architecture, forestry, laboratory technology, pharmacy, pre-dentistry, pre-medicine, pre-veterinary medicine, industrial management, textile science in home economics, and arts and sciences. The weekly three-hour laboratory periods are devoted to the performance of appropriate experiments.

206. **Introductory Physics—Electricity and Light (5). Lec. 4, Lab. 3. Pr., PS 205.**

Continuation of PS 205.

210. Principles of Modern Physics (5). Lec. 4, Lab. 3. Pr., PS 206.

The fundamental principles of physics to current topics. Lecture discussions are extended and supplemented by laboratory experience. Subjects include relativity, atomic and nuclear phenomena, and radiation.

215. Astronomy (5). Lec. 4, Lab. 3. Open to non-science majors.

The planet Earth and the solar system; the stars; theories of stellar evolution, galaxies and the expanding universe; modern cosmological theories. The laboratory emphasizes studies with the telescope.

220. General Physics I (4). Lec. 3, Lab. 3. Pr., MH 163 or concurrently.

Mechanics. PS 220-221-222 comprise a three-quarter sequence using calculus wherein a number of topics are discussed in depth. The sequence is intended to serve as a foundation for students in the mathematics, science, and engineering curricula.

221. General Physics II (4). Lec. 3, Lab. 3. Pr., PS 220, MH 264 or concurrently.

Fluids, wave motion, sound, thermodynamics, and light.

222. General Physics III (4). Lec. 3, Lab. 3. Pr., PS 221.

Electricity and magnetism.

300. Electricity and Magnetism (4). Lec. 3, Lab. 3. Pr., PS 222 or PS 206, MH 265.

Basic study of capacitance, inductance, DC circuits, transient and steady state AC circuits; laboratory exercises emphasize electrical and magnetic measurements, with experimental verification of analytical solutions to practical problems.

301. Electromagnetism (5). Lec. 4, Lab. 3. Pr., PS 222 or PS 206, MH 501.

Electrostatics, study of fields in dielectrics, magnetic forces and effects, electric and magnetic properties of matter, development of Maxwell's equations, electromagnetic wave propagation, and radiation. Selected laboratory exercises will examine the production, measurement, and interaction with matter of electric and magnetic fields.

302. Electronics (5). Lec. 4, Lab. 3. Pr., PS 300, MH 265.

Review of AC and DC circuits; theory of vacuum tubes and semiconductors; diodes as rectifiers and regulators; tube and transistor voltage and power amplifiers; feedback amplifiers and oscillators; pulse and digital circuits. Appropriate laboratory exercises form a part of the course.

303. Optics (5). Lec. 4, Lab. 3. Pr., PS 301, MH 501, junior standing.

Intermediate course in physical optics comprising wave motion, reflection, refraction, dispersion, origin of spectra, interference, diffraction, and polarization, with appropriate laboratory experiments.

304. Applied Spectroscopy (5). Lec. 4, Lab. 3. Pr., PS 222 or PS 210, MH 264.

The more important concepts of the origin of spectra: a study of instruments and techniques of practical spectroscopy. Laboratory experiments designed to give students in both chemistry and physics a working knowledge of spectroscopy as a tool.

305. Introduction to Modern Physics (5). Lec. 4, Lab. 3. Pr., PS 222 or PS 206, MH 265.

Introduction to relativistic kinematics and dynamics, particle aspects of electromagnetic interaction, wave aspects of material particles, structure of the hydrogen atom, many electron atoms, nuclear structure and reactions, and molecular and solid-state physics.

320. Modern Physics for Engineers (3). Lec. 3. Pr., PS 222, MH 264.

Introduction to modern physics, including special relativity, Schrödinger wave mechanics, atomic and nuclear systems, elementary particles.

340. Intermediate Mechanics (3). Pr., PS 221, MH 265.

Selected topics in mechanics including vector and coordinate kinematics and dynamics; free and driven damped harmonic oscillator; generalized coordinates and an introduction to Lagrange's equations.

412. Seminar in Modern Physics (1). Pr., senior standing.

Library search, written reports, and oral presentation of a pertinent topic in modern physics.

490. Special Topics (1-5). Pr., consent of instructor. May be taken for credit more than once.

Topics will vary as needed. They will include but will not be limited to such areas as: non-linear systems, gravitation, theory of waves, group theory, atomic and molecular processes, elasticity, fluid mechanics, and low temperature.

ADVANCED UNDERGRADUATE AND GRADUATE**501. Mechanics I (5). Pr., MH 265.**

Newtonian mechanics, linear oscillations, non-linear oscillation introduction to calculus of variations.

502. Mechanics II (5). Pr., PS 501.

Hamilton's principle and Lagrange's equations, central force motion, collisions, non-inertial frames, rigid body dynamics, vibrating systems.

503. Advanced Electromagnetism (5). Pr., PS 301.

Application of Maxwell's equations to radiation and the interaction of the electromagnetic field with matter.

504. Statistical Thermodynamics (5). Pr., PS 516, senior standing.

Temperature, entropy, and chemical potential are developed from the principles of equilibrium quantum states. The Gibbs representation is introduced and applied to the development of equilibrium distribution functions. Quantum statistics is developed and applied to problems.

- 505. Nuclear Physics (5). Lec. 4, Lab. 3. Pr., PS 305 or 320, MH 265.**
Nuclear radiations; transmutations; natural and artificial radioactivity; binding energy; nuclear forces; structure of the nucleus; nuclear fission and its applications. Appropriate laboratory experiments form a part of the course.
- 506. Advanced Laboratory I (2). Lab. 6. Pr., PS 301 or 302, 305.**
Research oriented experiments will be selected in the areas of biophysics, plasmas, low temperature, high vacuum, wave propagation, nuclear and atomic spectroscopy, Mossbauer effect, nuclear magnetic resonance, transport in solids, Hall effect, mass spectrometry, advanced electronics, and other areas of current interest in research.
- 507. Advanced Laboratory II (2). Lab. 6. Pr., PS 506.**
A continuation of PS 506.
- 508. Advanced Laboratory III (2). Lab. 6. Pr., PS 507.**
A continuation of PS 507.
- 509. Introduction to Reactor Physics I (5). Lec. 4, Lab. 3. Pr., PS 305 or 320, and MH 265.**
Brief account of nuclear physics; basic instrumentation; interaction of neutrons with matter; chain reactions; neutron diffusion; the bare homogeneous thermal reactor; lattice constants; reactor kinetics.
- 510. Introduction to Reactor Physics II (5). Lec. 4, Lab. 3. Pr., PS 509.**
Homogeneous reactor with reflector; reactor control; power reactors; thermal aspects of reactor systems; design variables; radiation detection and measurement; shielding; radiation hazards.
- 513. Introduction to X-ray Crystallography (5). Lec. 4, Lab. 3. Pr., PS 305, or consent of instructor.**
Principles of crystallography, the reciprocal lattice, theory of x-ray diffraction, and the powder, laue, and diffractometer methods.
- 514. Electron Microscopy (5). Lec. 3, Lab. 6. Pr., PS 222 and MH 264.**
Electron optics; theory and operation of the electron microscope; techniques of mounting, replication and shadowing of specimen; electron diffraction, theory and interpretation of patterns.
- 515-516. Intermediate Modern Physics I and II (5-5). Pr., MH 265, PS 305 or PS 320.**
Special theory of relativity; introductory quantum mechanics with applications to microscopic systems; Fermi-Dirac, Bose-Einstein statistics; and electronic bands in solids.
- 517. Introduction to Biophysics (5). Pr., consent of instructor.**
The physics of biological systems, with emphasis on the cellular and subcellular levels; effects of light and high energy radiations; bio-electric phenomena; bio-energetics, etc.
- 519. Scientific Instrumentation (3). Lec. 2, Lab. 3. Pr., PS 206, MH 162, consent of instructor.**
For advanced undergraduates and graduate students in the natural sciences. The course is directed to the selection and use of equipment normally used for lab experimentation in the scientific fields. Pertinent laboratory experiments will accompany the course.
- 521. Modern Electronics (5). Lec. 3, Lab. 6. Pr., PS 302.**
Network theory and digital logic; state-of-the-art electronic devices; operational amplifiers; linear and digital integrated circuits; servo systems; selected topics in modern instrumentation.
- 525. Principles of Nuclear Energy Systems (5). Pr., PS 305 or 320 and MH 265 or consent of instructor.**
Fundamental aspects of nuclear energy systems including: nuclear properties of matter, the fission process, radiation, nuclear reactor and plant design, thermal aspects of nuclear reactors, reactor control, safety analysis, licensing, isotope power sources, space applications, and fusion.
- 535. Introduction to Solid State Physics (5). Pr., PS 305 or 320, MH 264.**
Solid state phenomena including lattice vibrations, band description of electronic states in metals, semiconductors and insulators, and magnetic phenomena.
- 545. Plasma Physics (5). Lec. 4, Lab. 3. Pr., PS 303, and 305 or 320; consent of instructor or senior standing.**
Collision phenomena in gases, elementary processes, creation of ionized gas (plasma), interaction of plasma and fields, plasma heating, instabilities, radiation, man-made and natural applications.
- 560. Astrophysics (5). Lec. 4, Lab. 3. Pr., MH 265, PS 305 or 320.**
Astrophysics for students of science, engineering, and mathematics.
- 570. Health Physics (5). Lec. 4, Lab. 3. Pr., consent of instructor.**
Fundamental principles of radioactivity; instrumentation for detecting and monitoring radioactive nuclides; radiation effects on man; permissible radiation dosages; safe handling of radioactive substances; and shielding from various radiations.

GRADUATE

- 601. Advanced Dynamics I (3). Pr., PS 502.**
D'Alembert's principle; introduction to the calculus of variations; Hamilton's principle and Hamilton's equations; principle of least action.

602. Advanced Dynamics II (3). Pr., PS 601.

Canonical variables and contact transformations; the Hamilton-Jacobi equation; action; angle variables; Poisson brackets; continuous systems.

603. Mechanics of Continuous Media (3). Pr., PS 602.

Introduction to theories of elasticity and fluids.

604-605-606. Theory of Electricity and Magnetism I-II-III (3-3-3). Pr., PS 503 or EE 391; Coreq., MH 607-608-609.

Maxwell's formulation of classical electromagnetic theory. Includes electrostatics, magnetostatics, potential problems; electric currents. Maxwell's equations, electromagnetic waves, radiation theory, boundary value problems.

607. Physical Optics (3). Pr., PS 606.

Application of Maxwell's equations to optical phenomena including Kirchhoff's formulation, propagation of electromagnetic waves in anisotropic media, double refraction, dispersion.

611. Plasma Physics I (3). Pr., PS 301, 502 or consent of instructor.

Particle interactions and orbit theory, plasma kinetic theory, Boltzmann equation, transport phenomena, Fokker-Planck equation, plasma generation and diagnostics.

612. Plasma Physics II (3). Pr., PS 611 or consent of instructor.

Wave phenomena in plasmas, free and forced plasma oscillations, waves in anisotropic plasmas, shock waves, plasma stability, beam-plasma interactions.

613. Plasma Physics III (3). Pr., PS 612 or consent of instructor.

Radiation processes in plasmas without magnetic fields, bremsstrahlung of transverse waves, cyclotron radiation and echoes, scattering of transverse waves.

614. Plasma Spectroscopy (3). Pr., PS 606, PS 642, or consent of instructor.

Classical and quantum radiation theory, line oscillator strengths, line-broadening, equilibrium relations, temperature and density measurements.

628. Statistical Mechanics I (3). Pr., PS 502, 504.

Theory and applications of equilibrium statistical mechanics; relation of statistical mechanics to thermodynamics.

629. Statistical Mechanics II (3). Pr., PS 628.

Statistical mechanics of quantum mechanical systems; introduction to non-equilibrium statistical mechanics. Boltzmann transport equation. Fluctuations and dissipation.

630. Modern Physics for High School Teachers (5). Lec. 4, Lab. 3. Pr., MH 587 or equivalent.

Physics since 1890 including: structure of matter, atomic and molecular spectra; X-rays, natural and induced radioactivity; nuclear fission and fusion, and cosmic rays.

632. Special Theory of Relativity (3). Pr., PS 602, 604.

Relativistic mechanics, covariant formulation of Maxwell's field equations, Lagrangian and Hamiltonian formulation of fields.

635. Solid State Physics I (3). Pr., PS 535, PS 643.

Electrons in a perfect crystal lattice, description of the symmetry properties of solids, Brillouin zones.

636. Solid State Physics II (3). Pr., PS 635.

Cohesive energy, interaction of electrons with electromagnetic radiation, interactions between electrons and the crystal lattice.

637. Solid State Physics III (3). Pr., PS 636.

Magnetic properties of solids; para-, dia-, ferro-, and antiferromagnetic effects. Resonance experiments, optical properties of solids.

639. Directed Reading in Physics (2). Pr., consent of instructor. May be repeated for credit.**641. Quantum Mechanics I (3). Pr., PS 502.**

Action principle; Schrödinger's equation; operator formalism; bound state problems; angular momentum.

642. Quantum Mechanics II (3). Pr., PS 641.

Transformation theory; perturbation calculations; particle in electromagnetic field; radiative transitions.

643. Quantum Mechanics III (3). Pr., PS 642.

Scattering theory; S matrix; identical particles; applications.

644-645. Advanced Quantum Mechanics I-II (3-3). Pr., PS 643 or consent of instructor.

Dirac electron; field quantization; interactions; Feynmann diagrams, dispersion relations.

650. Biological Effects of Radiation (5). Lec. 3, Lab. 6. Pr., ZY 310 or ZY 525 or equivalent, PS 205 and PS 206 or equivalent, or consent of instructor. (Same as ZY 650.) Summer.

An introduction to radiation biology including radiation physics; radiation detection equipment; dosimetry; the effects of ionizing radiation at molecular, cellular, organ, and organismic levels, and radioprotection. Credit in ZY 650 precludes credit in PS 650.

653. **Seminar in Physics (2). Pr., consent of instructor. May be repeated for credit.**
655. **Special Topics in Theoretical Physics (3). Pr., consent of instructor. May be repeated for credit.**
Choice of topic will vary but will include: relativity theory; group theory; atomic and molecular structure; elasticity; fluid mechanics; quantum field theory; low temperature physics.
661. **Nuclear Structure (3). Pr., PS 505, PS 643.**
Selected topics on properties of nuclei.
662. **Nuclear Processes (3). Pr., PS 661.**
Radioactive decay, nuclear reactions.
- 671-672. **Advanced Solid State Theory I and II (3-3). Pr., PS 637.**
Quantum field theory methods of solving the many-body problem, second quantization, statistical mechanics in occupation number formalism, Feynmann diagrams and infinite-order perturbation theory, Green's function propagators, "dressed" interactions and quasi-particles, many-body effects in metals, Fermi liquid theory, present-day theories of super-conductivity, ferromagnetism, and other cooperative phenomena.
691. **Directed Reading in Contemporary Physics. (Credit to be arranged.) Pr., completion of 30 hours of advanced courses in physics. May be repeated for credit.**
699. **Research and Thesis. (Credit to be arranged.)**
799. **Research and Dissertation. (Credit to be arranged.)**

Political Science (PO)

Professors Fortenberry, *Head*, Hayhurst, Hobbs, and Robertson
Associate Professors Dickson, Johnson, McNorton, and Walkin
Assistant Professors Heilman, Kelly, Latimer, Martin,
Nelson, Pickering, Pendergast, and Widell
Instructors Burns, Cannon, and Giles

209. **Introduction to American Government (5).**
Constitutional principles; federalism; elections and public opinion; legislative, executive, and judicial departments; principal functions.
210. **American State and Local Government (5).**
State constitutional principles; organization and functions of state government; national-state and state-local relations; special attention to Alabama government.
260. **Survey of Law Enforcement (5). Pr., sophomore standing. (Same as LE 260.)**
Introduction to the philosophical and historical backgrounds; agencies and processes; purposes and functions; administration and technical problems; career orientation.
300. **Scope and Methods of Political Science (5). Pr., PO 209 or PO 210 and sophomore standing.**
Scope of and approaches to the study of political science and its sub-specialties; survey of the basic techniques of political analysis with emphasis on data, theory, techniques and methods of empirical research.
301. **Political Science Statistics (5). Pr., sophomore standing.**
Introduction to elementary statistical procedures applied to political science subject matter.
309. **Introduction to International Relations (5). Pr., sophomore standing.**
International relations, including a consideration of the bases of national power and the rudiments of international politics.
311. **International Organization (5). Pr., sophomore standing.**
The evolution of international organization from the beginning through the United Nations.
312. **Introduction to Comparative Government and Politics (5). Pr., sophomore standing.**
Methods of classifying governments by institutional and developmental characteristics. A review of the forces which create political stability and instability, democracy and dictatorship; contemporary political systems in selected countries will be used for comparison.
314. **American Foreign Policy (5). Pr., sophomore standing.**
Analysis of the decision-making process of American foreign policy and of selected current issues of American foreign policy.
315. **American Political Thought (5). Pr., sophomore standing.**
The principal American political philosophers and philosophies and their influence on political institutions.

- 316. National Security and Foreign Policy (3). Pr., sophomore standing.**
Introduction to national security as a part of United States foreign and domestic policies, and as a factor in international relations; the development of United States security policies; national security decision-making; civil-military relations; independent and collective means to seek security, and arms control and disarmament.
- 320. Intergovernmental Relations (3). Pr., PO 209 or 210 and sophomore standing.**
Relationships between units of local, state and national governments in structural and policy areas; federalism in theory and practice.
- 323. Municipal Government in the United States (5). Pr., PO 210 and sophomore standing.**
Functions of city government; relation of city to state; electorate, party system and popular control; forms of government; administrative organizations; some reference to Alabama.
- 325. Introduction to Public Administration (5). Pr., sophomore standing.**
Organization, development, procedures, process, and human factors involved in administration in a political environment.
- 326. Theory of Public Organization (3). Pr., sophomore standing.**
The structure and functioning of governmental organizations with an emphasis on theories of administrative hierarchies and evaluation of bureaucracy.
- 327. Policy and Administration (5). Pr., sophomore standing.**
Formulation, decision making and implementation of public policy in its administrative context.
- 328. Government and the Economy (3). Pr., sophomore standing.**
An examination of constitutional and political bases of governmental action; the origin and evolution of policies; relationships between political and economic institutions; and the consequences of governmental action or inaction.
- 329. The American Presidency (3). Pr., PO 209, sophomore standing.**
The President as legislative leader, chief executive, chief diplomat, and commander-in-chief. Political styles and personalities of recent presidents. Presidential decision-making.
- 330. Introduction to National Law (3). Pr., sophomore standing.**
Development of Western state legal systems, rule making, functions of law in society, legal interpretation.
- 331. The Legislative Process (3). Pr., PO 209 or PO 210, sophomore standing.**
The principles, procedures, and problems of lawmaking in the United States: special attention to Congress and the state legislatures.
- 332. The Judicial Process (3). Pr., sophomore standing.**
The role of the courts; the nature of jurisprudence; comparative legal systems; the origin of law; and the concept of legality.
- 333. Administrative Responsibility (3). Pr., sophomore standing.**
Roles and functions of public administration in a democratic society. Emphasis on bureaucratic ethics.
- 336. Criminal Justice (3). Pr., sophomore standing.**
An in-depth examination of the various procedural due process rights of the Constitution as they relate to the criminal processes—historical development, modern interpretations, and further trends.
- 340. Political Parties and Politics (5). Pr., PO 209, sophomore standing.**
The nature, organization, and operation of political parties in the United States: the suffrage; nominating and electoral processes; importance and nature of interest groups.
- 341. Pressure Groups (3). Pr., sophomore standing.**
Major private associational groups affecting public policy in the United States. Special attention to their structures, funding, public regulation, and political activities.
- 355. Reporting of Political Affairs (3). Pr., PO 210. (Same as JM 355.)**
Instruction and news assignments in political affairs with emphasis on state government. Credit in JM 355 precludes credit in PO 355.
- 445. Government and Politics of the Developing Nations (5). Pr., junior standing.**
Broad analysis of political underdevelopment and developing nations, taking account of forces for modernization, problems of internal stability, system characteristics, ideologies, socio-economic development policies, roles in the international community and prospects.
- 450. Internship (5-10). Pr., PO or PUB major and junior standing. (S-U grading only.)**
Practical political or administrative experience in public agencies or related activities arranged and approved by the department.
- 451. Internship Reading Course (5). Coreq., concurrent enrollment in either PO 450 or LE 464. Consent of instructor.**
Content of reading by agreement of student and instructor. Not open to graduate students.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. American Constitutional Law I (5).**
The Constitution of the United States on the basis of the decisions and opinions of the Supreme Court defining judicial review, the relationship of the executive, legislative, and judicial branches of the national government, and the federal system.

- 502. American Constitutional Law II (5).**
The Constitution of the United States on the basis of the leading decisions and opinions of the Supreme Court defining civil rights in relation to both national and state governments.
- 505. Metropolitan Area Governmental Problems (3).**
Political, governmental, and administrative organization and actions in urban areas with many governmental entities; governmental problems resulting from urbanization and possible solutions.
- 514. Financial Administration (3).**
Theory and practice of budgeting with emphasis on the politics of financial administration and accountability.
- 515. Public Personnel Administration (3).**
Personnel policies and processes of national, state and local governments. The role of politics in public personnel management.
- 517. Labor Relations in Public Organizations (3).**
The background, legal and constitutional aspects and administration of group negotiations and collective bargaining in public employment.
- 518. Administrative Law (3).**
General nature of administrative law; types of administrative action and enforcement; analysis of rule-making and adjudication; administrative due process; judicial review. Case method.
- 519. Problems in Public Administration (5). Pr., consent of instructor, senior or graduate standing.**
Review of selected problems in public administration through readings, case studies and individual research projects.
- 520. Political Thought Before the Nineteenth Century (5).**
The development of political thought from the Greeks to 1800: attention to the philosophers and the early theories that are found in modern political institutions.
- 521. Political Behavior (5). Pr., PO 300 or consent of instructor.**
An analysis of the processes of political attitude formation. Special emphasis on the development and testing of empirical theories of political culture, political socialization process, public opinion formation and participation.
- 522. Recent and Contemporary Political Theory (5).**
The political theories of the nineteenth and twentieth centuries; analysis and comparison of modern ideologies.
- 523. Communist Theory and Practice (3).**
Marxist ideology as modified by Lenin, with illustrations of actual practice drawn from all sides of the communist world.
- 526. Governments of Western Europe (5).**
Descriptions and analyses of the principal political structures and power systems of Western Europe with particular emphasis upon Great Britain, France, and Germany.
- 528. Government and Politics of the Near East (5).**
The political environment, institutions, and processes of the Near East countries, radicalism and conservatism in the area, the Arab-Israeli conflict, and major power interests.
- 533. Government and Politics of the Far East (5).**
The political environment, institutions, and processes of the Far East, with emphasis on China and Japan; also foreign relations of the area including Great Power interests.
- 534. Government and Politics of Africa (5).**
The political environment, institutions, and processes of sub-Saharan Africa. The colonial heritage; problems of tribalism, stability, and political and economic development, with special attention to selected countries and current events and issues.
- 535. Contemporary International Politics (5).**
A survey of the conflicts of national interests in contemporary international politics with special emphasis on the efforts to resolve these issues through diplomacy. This course will give students the opportunity to apply their academic training to an analysis of actual contemporary international issues.
- 536. Government and Politics of the Soviet Union (5).**
A study of the present status of the Soviet totalitarian system with attention to its origin, the essentials of the Stalinist pattern, the post-Stalinist political dynamics, and the nature and significance of contemporary changes.
- 537. Soviet Foreign Policy (5).**
The factors affecting Soviet foreign policy as seen in historical perspective, with emphasis on the post-war Stalinist practices and the modifications made by the post-Stalin leadership.
- 538. Government and Politics of Eastern Europe (5).**
A comparative study of the political institutions of the Eastern European Communist states, emphasizing especially those features which diverge the most from the totalitarian pattern of the Stalinist era. Attention will also be given to the foreign relations of the Eastern European powers, including those with the Soviet Union and Communist China.

539. Government and Politics of Latin America (5).

The political environment, institutions, and processes of Latin America with emphasis on dynamic factors that influence the degree of democracy and authoritarianism, stability and instability, and politicoeconomic development in the area.

540. International Law (5).

The origin and development of international law with special emphasis on recent and current developments—trends.

541. Latin America and the United States (3).

An analysis of Latin American-United States relations in their political, social and economic aspects taking into account the natures, causes and consequences of policies followed by the nations involved.

590. Seminar in Political Science Methodologies (5). Pr., senior or graduate standing.

Critical review of the literature on approaches, analytical constructs, research techniques and data compilation in national and cross-national perspectives.

GRADUATE**611. Seminar in American Government (3-5).**

A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of American government.

613. Seminar in State and Local Government (3-5).

A systematic examination of functions, problems, and issues within the political and constitutional framework of selected areas of state and local government. Some attention will be given to Alabama.

625. Seminar in Political Parties, Pressure Groups and Political Issues in the United States (5).

The interaction of political parties, pressure groups and the general public as a determinant in resolving political issues.

635. Seminar in Public Administration (5).

Various processes, functions, theories, practices and systems as treated in the literature of public administration.

645. Seminar in Comparative Government (5).

The major institutions, functions, and problems of representative political systems. Includes the methodology and bibliography of comparative government and politics.

655. Seminar in International Relations (5).

The basic literature of the field of International Relations with special emphasis on the critical evaluation of this material.

665. Seminar in Political Theory (3-5).

The problems of scope and methods of inquiry in the fields of political theory with intensive research in selected topics.

675. Seminar in Constitutional Law (5).

Selected areas of constitutional law with readings in depth in relevant cases and constitutional theory.

699. Research and Thesis. (Credit to be arranged.)**READING COURSES**

Directed reading courses enable graduate students to pursue specialized topics. They require permission of the department head or graduate adviser, and the supervisory professor. They may be repeated for credit. Normally a reading course in a subject should be taken after the seminar in that subject. Except by special permission no more than two reading courses may be taken in a master's program.

617. Reading Course in American Government (3-5).**627. Reading Course in Public Law (3-5).****637. Reading Course in Public Administration (3-5).****647. Reading Course in Comparative Government (3-5).****657. Reading Course in International Relations (3-5).****667. Reading Course in Political Theory (3-5).**

Poultry Science (PH)

Professors Moore, Head, Cottier, Edgar, and Mora
Associate Professors Brewer, McDaniel, and Roland

- 201. Poultry Science (5). Lec. 4, Lab. 2. Fall, Winter, Spring, Summer.**
Principles of poultry production, including breeding, feeding, housing, and diseases.
- 302. Poultry Meat Production (3). Lec. 2, Lab. 2. Fall.**
Practical problems involved in raising broilers and turkeys for meat production.
- 306. Fertility and Hatchability of Avian Species (3). Lec. 2, Lab. 2. Spring.**
Fertility, artificial insemination, embryonic development and hatchability of avian species.
- 407-409. Supervised Avian Investigations (3-3). Lec. 1, Lab. 4. Junior standing. All quarters.**
Investigation of some phase of avian science of interest to the student
- 422. Avian Diseases (5). Lec. 4, Lab. 2. Spring.**
Etiology, transmission, diagnosis, prevention and treatment of infectious and parasitic diseases. (For veterinary students only.)

ADVANCED UNDERGRADUATE AND GRADUATE

- 504. Poultry Management (5). Lec. 4, Lab. 2. Pr., PH 201. Winter.**
Poultry problems and management of commercial flocks.
- 505. Poultry Feeding (3). Pr., PH 201. Fall.**
Composition and use of poultry feeds in connection with the demands for growth, body maintenance, and egg production.
- 508. Control of Poultry Diseases and Parasites (5). Lec. 4, Lab. 2. Winter.**
Prevention, diagnosis, control and treatment of the common diseases and parasites of poultry.
- 510. Genetics of the Fowl (3). Lec. 3. Pr., ZY 300. Spring.**
Physiology of reproduction and inheritance of various poultry characters responsible for efficient egg and meat production and low mortality.
- 511. Processing and Marketing (3). Lec. 2, Lab. 2. Spring.**
Problems involved in processing and marketing poultry meat and eggs.
- 523. Biological Rhythms (5). Lec. 5. Pr., ZY 424 or approval of instructor. Spring.**
Factors that affect the rhythmic pattern of organisms. Both exogenous and endogenous rhythms will be studied.

GRADUATE

- 604. Advanced Poultry Production (5). Lec. 5. Spring.**
Advanced studies on various phases of poultry production.
- 606. Advanced Poultry Breeding (5). Lec. 4, Lab. 2. Fall.**
Advanced studies of the principles of heredity as applied to poultry breeding.
- 607. Advanced Poultry Problems (2 to 5). All quarters. (May be taken more than once to a maximum of 5 hrs.)**
Assigned problems.
- 608. Seminar. Credit to be arranged. Fall, Spring, Winter, Summer.**
- 610. Advanced Poultry Nutrition (5). Lec. 5. Summer.**
Advanced study of the nutrients, their function and the nutritional requirements of poultry.
- 611. Advanced Poultry Management (5). Lec. 5. Summer.**
Advanced study of the principles of management of commercial poultry flocks.
- 612. Advanced Poultry Diseases (5). Lec. 1, Lab. 8. Pr., PH 508 or consent of instructor. Spring.**
Isolation, cultivation, and identification of bacterial, fungal, and viral agents. Emphasis on biochemical aspects of microbial and nutritional diseases and the mechanisms of the immune response.
- 613. Advanced Poultry Diseases (5). Lec. 1, Lab. 8. Pr., VM 418 and PH 612, or equivalent. Summer.**
Continuation of PH 612 with emphasis on those disease conditions caused by protozoa, helminths, and arthropods and the gross and histopathology of diseases studied in both quarters.
- 614. Immunochemistry (5). Lec. 3, Lab. 4. Pr., general bacteriology, immunology and organic or biochemistry. Fall.**
Advanced study of the fundamental principles of immunology including specificity, antibody synthesis and the thermodynamics of antigen-antibody reactions. Laboratory will include the use of immunodiffusion, immunoelectrophoresis, fluorescent-antibody technique and quantitation of the precipitin reaction.

- 615. Avian Physiology (5). Lec. 2, Lab. 6. Pr., ZY 424 and organic chemistry. Winter.**
General physiology of birds with particular reference to domesticated species.
- 618. Experimental Virology (5). Lec. 3, Lab. 4. Pr., BY 442 and CH 420 or equivalent and consent of instructor. Winter.**
Advanced study of fundamental properties of plant, animal and bacterial viruses including biochemical and biophysical properties and mechanisms of infection. Laboratory includes isolation, purification and fractionation of viruses; identification of anti-viral agents using in vitro systems.
- 620. Transmission and Scanning Electron Microscopy (5). Lec. 2, Lab. 6. Pr., consent of instructor, graduate standing. Spring.**
Theory and operation of the transmission and scanning electron microscopes; techniques in fixation, embedding, sectioning, and staining. Interpretation of ultrastructures.
- 699. Research and Thesis (Credit to be arranged.) All quarters.**
Technical laboratory. Problems related to poultry.

Psychology (PG)

Professors Schaeffer, *Head*, Gynther, Lair, and McIntyre

Associate Professors Irvine, Rogers, and Vallery

Assistant Professors Burkhart, Burks, Epstein, Green, Hannay, Kelley, King, and McCoy

- 211. Psychology (5).**
An introduction to the field of behavior.
- 212. Psychology (3).**
The development of human behavior.
- 215. Quantitative Methods (5). Lec. 3, Lab. 4. Pr., PG 211 and MH 140 or equivalent.**
Introduction to the measurement of behavior and to quantitative methods of data analysis.
- 300. Introduction to Clinical and Community Psychology (3). Pr., PG 211.**
Introduction to theory and methods of clinical and community psychology.
- 301. Psychology in the Criminal Justice System (5). Lec. 4, Lab. 2. Pr., PG 211.**
Introduction to theory, research, and applications of psychological principles in the criminal justice system.
- 302. Psychological Aspects of Death and Dying (3). Pr., sophomore standing.**
A survey of psychological literature on dying, death and grief.
- 320. Experimental Psychology I: Learning (4). Lec. 3, Lab. 3. Pr., PG 211 and PG 215.**
Concepts, problems, and experimental techniques in learning.
- 321. Experimental Psychology II: Perception (4). Lec. 3, Lab. 3. Pr., PG 211 and PG 215 or departmental approval.**
Discrimination, generalization, and their physical and psychological correlates.
- 322. Experimental Psychology III: Personality (4). Lec. 3, Lab. 3. Pr., PG 320.**
Introduction to personality with emphasis placed on the nature, description, dynamics and determinants of personality.
- 330. Experimental Social Psychology (4). Lec. 3, Lab. 2. Pr., PG 211 and PG 212 or SY 201 and SY 204.**
Introduction to the field of social psychology. Laboratory work relating to investigation of social psychological problems, data collection and analysis, and report writing.
- 350. Behavior Modification in Early Childhood (5). Lec. 3, Lab. 4. Pr., departmental approval.**
Application of learning principles to the modification of behavior in the preschool child. Laboratory practice will supplement classroom discussion.
- 360. Fields of Professional Psychology (5).**
Contributions of psychology to medicine, education, law, and human engineering in industry. Not open to students majoring in psychology.
- 420. Psychology of Women (5). Pr., junior standing.**
Women from a psychological point of view covering stereotypes, roles, and origins of sex differences.
- 444. Psychological Aspects of Sexual Behavior (5). Pr., junior standing.**
Human sexuality from a psychobiological perspective.

ADVANCED UNDERGRADUATE AND GRADUATE

- 507. Maturity and Aging (5). Pr., PG 212.**
Development psychology relating to changes in and problems of human maturity from early adulthood to old age.

- 515. Introduction to Theory of Measurement (5). Pr., PG 215 or departmental approval.**
Theories of measurement and psychological testing with examples of their applications.
- 516. Psychological Testing (5). Lec. 3, Lab. 6. Pr., PG 515 or departmental approval.**
Issues and applications of group assessment techniques.
- 530. Perception (4). Pr., PG 321 or departmental approval.**
Theories of perception, emphasizing both general and individual factors that influence meaning.
- 531. Social Psychology (5). Pr., department approval.**
Social psychological processes and theories of social behavior.
- 533. Personality (4). Pr., 10 hours of psychology or departmental approval.**
Objective, phenomenological, and psychoanalytic theories of personality.
- 534. Psychology of Exceptional Children (5). Pr., PG 212.**
Psychological aspects of handicapped and gifted children.
- 535. Behavior Pathology (4). Pr., 10 hours of psychology or departmental approval.**
Types of abnormal behavior and their social and biological origins. Opportunities for field trips will be provided.
- 536. Psychology of Abnormal Children and Adolescents (5). Pr., PG 212.**
Introduction to cognitive, emotional, and behavioral disturbances in children and adolescents.
- 540. Physiological Psychology (5). Pr., PG 320 and PG 321 or departmental approval.**
The physiological correlates of behavior.
- 545. Animal Behavior (5). Pr., PG 320 and PG 321 or departmental approval.**
Analysis of unlearned and learned animal behavior and its evolutionary development, integrating the contributions of ethological and behavioristic research.
- 550. Learning (4). Pr., PG 320 or departmental approval.**
Theories of learning and their logical and empirical foundations.
- 555. Human Learning (5). Pr., PG 320 or departmental approval.**
Survey of research methodology, empirical data, and theoretical interpretations relevant to the acquisition, retention and forgetting of verbal concepts and verbal materials.
- 557. Techniques and Applications of Behavior Therapy (5). Pr., PG 320 or PG 350 and departmental approval.**
Analysis of empirically derived therapeutic procedures and their application to socially and clinically relevant behavior.
- 561. Industrial Psychology (5).**
The uses of psychology in business and industry.
- 562. Training and Supervision of Industrial Personnel (3).**
Application of the principles of learning to the training of factory, office, and sales employees.
- 563. Interviewing and Classifying Industrial Personnel (3).**
Principles and practices in interviewing.
- 580. History of Psychology (4). Pr., 20 hours of psychology or departmental approval.**
Evolution of psychology from physics, physiology, and philosophy to a science of behavior.
- 590. Special Problems in Psychology (1-8). Pr., departmental approval. May be repeated for a maximum of 8 credit hours but only one registration per quarter permitted.**
An individual problems course. Each student will work under the direction of a staff member on some experimental or theoretical problem of mutual interest.

GRADUATE

- 600. Behavior Theory (5). Pr., 20 hours of experimental and theoretical psychology and departmental approval.**
Survey of current theory in psychology and introduction to theory construction.
- 601. Ethics and Problems of Professional Psychology (5). Pr., PG 600 and departmental approval.**
Survey of ethical issues and current problems in professional psychology.
- 602. Community Psychology (5). Pr., PG 601.**
Historical overview of community psychology and analysis of empirical and theoretical issues in community psychology.
- 605. Developmental Psychology I (5). Pr., PG 533.**
An examination and critical analysis of research on selected topics and theories in developmental psychology.

- 606. Developmental Psychology II: Psychopathology of Childhood (5). Pr., PG 605.**
An examination of the current research and theory of behavioral disorders in childhood.
- 607. Psychological Assessment of Children (5). Pr., PG 606, PG 670, PG 671, PG 672 and consent of instructor.**
Introduction to the cognitive and personality assessment of infants, children, and adolescents.
- 608. Techniques of Psychotherapy and Behavior Change with Children (5). Pr., PG 607 and consent of instructor.**
Introduction to methods of prevention and treatment of cognitive, emotional, and behavioral disorders of children and adolescents.
- 620. Experimental Psychology I: Learning (5). Lec. 3, Lab. 6. Pr., PG 320 or departmental approval.**
Analysis of learning, stressing experimental methodologies illustrative of major theoretical approaches.
- 621. Experimental Psychology II: Psychophysics (5). Lec. 3, Lab 6. Pr., PG 321 or departmental approval.**
Physiology of receptor function and methodologies relating physical properties of stimulation to subject response variables.
- 622. Experimental Psychology III: Social (5). Lec. 3, Lab. 6. Pr., PG 601.**
Consideration of content relating to attitudes and methodology in the area of social psychology.
- 623. Analysis of Behavior (5). Lec. 2, Lab. 10. Pr., PG 620.**
Methods and concepts of operant conditioning research with animals and humans stressing current research and literature.
- 625. Experimental Design I (5). Pr., PG 215 or departmental approval.**
Probability theory, sampling distributions, estimation procedures, and hypothesis testing.
- 626. Experimental Design II (5). Pr., PG 625.**
Regression and correlation, analysis of variance, and nonparametric statistics.
- 629. Quantitative Methods for Clinical Research (5). Pr., PG 625 and 626.**
Analysis of time-dependent data and other quantitative problems of interest to clinicians.
- 631. Social Psychology (5). Pr., PG 531.**
Major systems and theories relating to social psychology, including Gestalt, reinforcement, psychoanalytic, role and field theory.
- 634. Group Behavior Change (5). Pr., PG 637, 638 and departmental approval.**
Study of group psychotherapy and behavioral group techniques.
- 635. Theories of Personality (5). Pr., PG 601.**
Analysis of current issues in personality theory.
- 637. Behavior Pathology (5). Pr., PG 601.**
Current theoretical conceptions and research in psychopathology.
- 638. Systems of Psychotherapy (5). Pr., PG 635 and 637, or consent of instructor.**
A survey of theories and research related to modern systems of psychotherapy.
- 639. Practicum in Behavior Change (1-5). Pr., PG 635, 637, 638 and/or consent of instructor. Must be taken at least three consecutive quarters. A minimum of 10 hours is required for Ph.D. in clinical and community psychology. May be repeated for a maximum of 20 hours. (Psychology majors only.)**
Individual supervision in psychotherapy and behavior change with emphasis on developing applied clinical skills.
- 640. Physiological Psychology (5). Lec. 2, Lab. 10. Pr., PG 621.**
Physiological basis of behavior.
- 645. Comparative Psychology (5). Lec. 2, Lab. 10. Pr., PG 620.**
Analysis of intra- and inter-species behavior emphasizing physical and physiological uniquenesses, response comparability, and generalizability, of behavioral principles.
- 650. Theories of Learning (5). Pr., PG 620.**
A survey of major theories of learning.
- 655. Human Learning (5). Lec. 3, Lab. 4. Pr., PG 620 or departmental approval.**
Analysis of mnemonic models and experimental paradigms utilized in the study of stimuli, organismic and response variables that influence concept learning, information processing, and short-term and long-term memory.
- 656. Behavior Modification (5). Lec. 3., Lab. 4. Pr., PG 623 or consent of instructor.**
Principles of behavior modification and practical experience to supplement classroom discussion.
- 657. Advanced Behavior Therapy (5). Pr., PG 656 and/or consent of instructor.**
The application of behavior therapy procedures within a single-case methodological framework.

- 670. Assessment of Intelligence (5). Lec. 3, Lab. 10. Pr., PG 516 and departmental approval.**
Theories of intelligence; supervised practice in the administration and interpretation of individual intelligence tests.
- 671. Personality Assessment I (5). Lec. 3, Lab. 6. Pr., PG 670 and departmental approval.**
Theory and application of methods of personality measurement with emphasis on interview and self-report data, and on the interpretation of tests of specific behavioral deficits.
- 672. Personality Assessment II (5). Lec. 3, Lab. 6. Pr., PG 671 and departmental approval.**
Theory and application of methods of personality measurement with emphasis on projective techniques.
- 673. Personality Assessment III. (Credit to be arranged.) Maximum of 5 hours credit may be applied to minimum requirements for master's degree. Psychology majors only.**
Supervised practicum in personality assessment.
- 675. Objective Techniques of Assessment (5). Pr., PG 516, 533.**
Administration and interpretation of objective measures of aptitudes, performance, and personality.
- 676. Teaching of Psychology (1-3). Pr., departmental approval. May be taken more than one quarter; credit in this course cannot count toward fulfilling the minimum 45 graduate hours for a master's degree.**
The problems and practices of teaching psychology at the college level. In addition to seminar meetings, students will work with senior faculty in appropriate courses.
- 680. Current Research in Psychology (2). Pr., consent of instructor. May be repeated for a maximum of 10 hours credit.**
Review of current research on selected topics in psychology. Six hours credit in this course required of all doctoral students.
- 690. Seminar. (Credit to be arranged.) May be taken more than one quarter but not more than one registration permitted in any one quarter.**
- 692. Research in Special Topics. (Credit to be arranged.) May be taken more than one quarter but not more than one registration permitted in any one quarter.**
- 699. Research and Thesis. (Credit to be arranged.) May be repeated for credit.**
- 799. Research and Dissertation. (Credit to be arranged.) May be repeated for credit.**

Religion (RL)

Professor Armour, *Head*
Assistant Professor Kuykendall

- 201. Introduction to Religion (3).**
Major themes in the study of religion, including religious experience, religion and society, and the diversity of religion. Examples from various religious traditions.
- 210. Introduction to the Old Testament (5).**
Historical-critical study of the Old Testament in its cultural setting. Emphasis upon development of Old Testament thought.
- 220. Introduction to the New Testament (5).**
Historical-critical study of the New Testament in its cultural setting. Survey of major issues in New Testament study.
- 230. History of Christianity (5).**
The growth and development of Christianity from 100 A. D. to the present. Major personalities, events, and movements.
- 245. Religion and Popular Culture (5).**
Religious themes and developments in contemporary American life.
- 301. Religions of Asia (5).**
Hinduism, Buddhism, Taoism, Confucianism, and Islam, with secondary attention to other Asian religions.
- 325. Paul (5). Pr., RL 220.**
Life, letters and thought of the Apostle Paul.
- 335. History of Christian Thought (5).**
Representative trends and thinkers from 100 A.D. to 1600 A.D.
- 340. Religion in America (5).**
A survey of religious activities, institutions and personalities in North America from the Colonial Period to the present.

- 350. Contemporary Religious Thought (5). Pr., one course in religion.**
Major twentieth century theologians—Protestant, Catholic, Jewish.
- 365. Religious Values and Sexuality (5). Pr., one course in religion.**
Religious views of human sexuality from biblical times to the present. Topics include marriage, celibacy, homosexuality, sexual roles in religious groups. Emphasis upon contemporary period.
- 490. Readings in Religion (3-5). Pr., junior standing and consent of instructor.**
A program of independent study on a special topic.

Sociology (SY) and Anthropology (ANT)

Professors Griessman, *Head*, and Hartwig

Associate Professor Shields

Assistant Professors Adams, Busch, French, Kowalski, Mohan, Reid,
Roberts, Starr, and Wilke

Instructors Carson, Gundlach, and Siegel

Lecturers Blow, Bradford, Loden, and McLemore

Joint appointees: Associate Professor Dunkelberger

Assistant Professors Littleford and Vanlandingham

GENERAL COURSES

- 201. Introduction to Sociology (5). Pr., third quarter freshman standing.**
Principles and processes in the social life of man.
- 350. Sociology Colloquium (1). Pr., SY 201. May be repeated for maximum of 3 credit hours.**
Designed to orient sociology majors toward major substantive fields of the discipline.

ADVANCED UNDERGRADUATE AND GRADUATE

- 514. Field Instruction (1-10). Pr., consent of instructor. May be repeated for a maximum of 10 hours credit.**
Supplementary instruction concurrent with experience in some field of work involving application of sociological perspectives to community life.
- 522. Special Topics in Sociology (1-5). Pr., SY 201 or consent of instructor. May be repeated for a maximum of 10 hours.**
Examines selected topics from a sociological perspective.
- 550. Directed Reading (1-5). Pr., consent of instructor. Senior standing. May be repeated for a maximum of 10 hours credit.**
An independent reading program, under supervision, to provide for the pursuit of specific interests in sociology not covered by other course offerings.

GRADUATE

- 650. Sociology Seminar (5). Pr., consent of instructor. May be repeated for a maximum of 10 credit hours.**
Designed for students engaged in intensive study and analysis of sociological subject areas.
- 680. Independent Study (1-5).**
Under supervision, to read and study materials in some substantive area of sociology.
- 699. Research and Thesis. (Credit to be arranged.) May be repeated for credit.**

Criminology-Corrections

- 302. Criminology (5). Pr., SY 201, junior standing.**
The causes of crime and its social treatment. Field trips required.
- 308. Juvenile Delinquency (3-5). Pr., SY 201.**
Historical and contemporary considerations relative to the juvenile offender. The emphasis is upon research data from the various sciences attempting to deal with this problem.

ADVANCED UNDERGRADUATE AND GRADUATE**526. Penology (5). Pr., SY 302.**

The history and development of corrections with particular emphasis upon modern rehabilitative processes.

530. Contemporary Corrections (5). Pr., SY 302 or SY 526 or consent of instructor.

An examination of current adult correctional programs and practices with emphasis on community corrections.

*Demography***ADVANCED UNDERGRADUATE AND GRADUATE****501. Population Problems (5).**

Problems of quantity and quality of population including problems of composition, distribution, and migration. Attention is given to Alabama population.

*Intergroup Relations***304. Minority Groups (5). Pr., junior standing.**

Racial composition of the United States with special emphasis on the adjustment of minority groups to the core society.

ADVANCED UNDERGRADUATE AND GRADUATE**520. Racial and Ethnic Relations (5). Pr., 10 hours of SY or consent of instructor.**

Utilizes cross-cultural data to describe situations in which race or ethnicity affect human behavior. These data interpreted by delineating patterns, trends, and relationships.

GRADUATE**604. Seminar in Race and Culture (5). Pr., SY 201 and SY 304 or consent of instructor.**

Adjustment of races to culture with particular reference to the South; the historical and cultural background of the races in America; bi-racial system; problems of race relations.

*Research Methods and Statistics***220. Statistics (5). Pr., SY 201.**

Basic statistical concepts, measures, and techniques used in sociological reports and research.

370. Methods of Social Research (5). Pr., SY 201 or RSY 361.

The principal methods of data collection and analysis in sociological research. Same as RSY 370. Credit in RSY 370 precludes credit in SY 370.

GRADUATE**630. Statistical Applications in Sociological Research (3-5). Pr., SY 220 or consent of instructor.**

A general survey of uses and limitations of statistical techniques used in sociology.

Rural Sociology

(For course descriptions, see Department of Agricultural Economics and Rural Sociology.)

*Social Organization***301. Sociology of the Family (5). Pr., SY 201 and junior standing.**

The family in cross-cultural perspective.

310. Social Organization (5). Alternate years. Pr., SY 201 or consent of instructor.

Focuses on the systems of roles, norms, and shared meanings that provide regularity in social interaction.

312. Marriage Adjustments (3). General elective. Pr., junior standing.

Emotional, social and biological factors in the family setting with emphasis upon adjustments of marriage and parenthood.

ADVANCED UNDERGRADUATE AND GRADUATE**507. Public Opinion and Propaganda (5). Pr., SY 201.**

The area of social communication; the formation, place and importance of publics in modern society, of public opinion research, and of propaganda and public relations techniques.

508. Industrial Sociology (5). Pr., SY 201.

The sociological approach to business organization and industrial relations. Emphasis given to organization principles operative in the economic life within a social system such as a factory or business establishment.

509. Sociology of Religion (5). Pr., SY 201 or consent of instructor.

Analysis of religion as a social institution as found in the world's great religions.

515. Social Stratification (5). Pr., SY 201.

Stratification is a fundamental feature of all societies. Past thought and current research and theory on structured social inequalities is systematically developed.

518. Sociology of Occupations (5). Pr., SY 201.

A comprehensive examination of specific occupational categories ranging from professional to service occupations. Special emphasis is placed on the relationship of occupational structures and institutions and the meaning of occupations for individuals and society.

GRADUATE**602. Seminar in the Family (5). Pr., SY 301 or consent of instructor.**

Study of the institutions of marriage, family, and kinship from a comparative and historical perspective.

608. Organizational Analysis (5).

A theoretical and empirical examination of the principal features of large-scale organizations in contemporary society. Directed research into particular organizational areas of present-day social life.

*Social Problems***202. Social Problems (5). Pr., SY 201.**

A sociological analysis of current social problems such as crime, mental illness, race relations, poverty, aging, etc.

ADVANCED UNDERGRADUATE AND GRADUATE**525. Social Deviance (5).**

Analysis of factors in the creation of and reaction to social deviance. Examines various theoretical approaches to deviance, with particular emphasis on how behavior comes to be defined as deviant.

GRADUATE**603. Social Problems (5). Pr., SY 202 and consent of instructor.**

Special social problems such as old age, crime and delinquency, minorities, etc., within the framework of social problem theory.

*Social Psychology***204. Social Behavior (5). Pr., SY 201 or PG 211.**

Integrated social-anthropological, biological, and psychological factors which influence or determine human behavior; the emphasis is upon the normal individual and/or group situations.

428. Small Groups (5). Pr., SY 204, PG 330, or consent of instructor.

Small group research and theory covering such areas as interpersonal exchange, group formation, social influence, and problem-solving behavior.

ADVANCED UNDERGRADUATE AND GRADUATE**534. Socialization (5). Pr., SY 201.**

Examines an important and distinct sociological tradition: mind, self, society and interaction as symbolic phenomena grounded in social processes. Covers major intellectual influences, concepts, and figures (e.g., James, Mead, Cooley).

GRADUATE**610. Seminar in Social Behavior (5). Pr., SY 204, PG 330, or consent of instructor.**

Research and theory concerning social and group influences on behavior.

Sociological Theory

- 309. Social Thought (5). Pr., and SY 201 or consent of instructor.**
Significant social thought leading to the emergence of modern sociological theory.
- 311. Technology and Social Change (3). General elective. Pr., junior standing.**
Relationship between technological development and changes in modern society. Special emphasis placed upon the human relations aspects of modern science. Designed primarily to meet social science needs of students in the fields of engineering, agriculture, education, and the physical sciences.
- 410. Sociology of Knowledge (5). Pr., SY 201 or consent of instructor.**
A review of sociological approaches to the understanding of human knowledge; a tracing of connection between knowledge and other facets of the sociocultural context.

ADVANCED UNDERGRADUATE AND GRADUATE

- 502. Social Theory (5). Pr., SY 201 or consent of instructor.**
Survey of theorists from Comte to the present; emphasizes theory construction, theoretical analysis, and differences in theoretical approaches.
- 504. Sociology of Power (5). Pr., SY 201.**
A systematic concern with the dimensions and distribution of power in social life.

GRADUATE

- 619. Theory Construction (5). Pr., SY 201; SY 309 or SY 502, or consent of instructor.**
Orientation and insight into the logic of theory construction in the social sciences, and the complementary problems of articulating research findings with theory.
- 620. Advanced Sociological Theory (5). Pr., consent of instructor.**
This course reviews principal types of sociological theory, exchange theory, and structural functionalism. It focuses on significant theoretical issues.

Urban Sociology

- 505. Urban Sociology (5).**
Growth and decline of cities with special emphasis on ecological and demographic characteristics, associations and institutions, class systems, and housing and city planning.

Anthropology (ANT)

- 203. Introduction to Anthropology (5). Pr., sophomore standing.**
Presents the anthropological perspective from the four major fields of anthropology: physical, cultural, archaeological, and linguistic.
- 206. Cultural Anthropology (5). Pr., ANT 203.**
The nature of culture. Comparative approach to the study of the principal institutions of human society and basic categories of human behavior.
- 207. Introductory Archaeology (5). Pr., SY 201 or ANT 203.**
The history, principles, and methods for investigating and reconstructing past cultures.
- 303. History of Anthropological Theory (5). Pr., ANT 203.**
The development of ethnological theory.
- 305. Culture and Personality (3). Pr., SY 201 or ANT 203.**
Socio-cultural factors in personality development and recent studies in national character.
- 306. Introduction to Physical Anthropology (5). Lec. 3, Lab. 3. Pr., ANT 203.**
Human origins and development: contemporary primate varieties, using a genetic and anthropometric approach.
- 403. Contemporary Anthropology (5). Pr., ANT 203, junior standing.**
Contemporary research and theory regarding primitive, traditional, and urban cultures.

ADVANCED UNDERGRADUATE AND GRADUATE

- 511. Language and Culture (5).**
The social basis of verbal communication; functions of language in society; importance of language in contemporary social problems.
- 512. General Ethnology (5).**
Surveys ethnological data from several societies in order to provide an understanding of the range and variability of cultural phenomena.

- 524. Special Topics in Anthropology (1-5). Pr., ANT 203 or consent of instructor. May be repeated for a maximum of 10 hours.**
Examines selected topics from an anthropological perspective.
- 532. Indians of North America (5).**
Aboriginal cultures of North America. Effects of culture contact. Contemporary problems of Indian communities.
- 612. Special Topics in Ethnology (5). Pr., consent or instructor.**
An intensive study of peoples and cultures from a particular geographical area of cultural adaptation.

Social Work (SW)

- 252. Social Work Colloquium (1).**
Orientation to the social work field and the human service professions. Explores the nature of undergraduate social work education and careers resulting from this type of instruction.
- 375. Introduction to Social Welfare (5). Pr., sophomore standing.**
Historical survey of development of the social welfare system. Emphasizes political, economic, and social factors involved. Introduction to health and welfare services of local community.
- 380. Foundations of Social Work (5). Pr., SY 201.**
The integration of social science perspectives for the social work student. Surveys interpretations of biological, socio-psychological, and cultural determinants of behavior for social work practice.
- 420. Social Work Field Placement (1-15). Pr., SW 375, SW 380, and consent of instructor.**
A planned field experience in which the student is placed in a community service agency, working under the joint supervision of the agency and the University. A seminar is held regularly to evaluate, discuss, and interpret the student's work.
- 426. Special Topics in Social Work (1-5). Pr., SY 201 or consent of instructor, junior standing. May be repeated for a maximum of 10 hours credit.**
Examines selected topics from a social work perspective.

ADVANCED UNDERGRADUATE AND GRADUATE

- 506. Social Work Methods I. (5). Pr., SW 375, SW 380 or consent of instructor.**
The nature of social work methods. Attention given to social work process with individuals, groups, and communities. Explores treatment techniques, concepts, and principles.
- 507. Social Work Methods II (5). Pr., SW 506.**
The nature of social work methods. Attention given to social work process with individuals, groups, and communities. Explores treatment techniques, concepts, and principles.
- 575. Social Welfare Policy (5). Pr., SW 375 or consent of instructor.**
Current problems, policy issues, and proposals in selected social welfare programs are critically examined and evaluated.

Speech Communication (SC)

Professors Bradley, Head, Barker, and W. Smith
Associate Professors Overstreet, Richardson and C. Smith
Assistant Professors Borton, Drake, Ford, Moore, Phillips,
Ritchey, Sanders, Stone, and Thomas
Instructors Bowman and Rushin

a. Foundations of Speech Communication

- 200. Introduction to Undergraduate Study in Speech Communication (5).**
Acquaints the prospective speech major or minor with the fundamentals of speech, the historical, psychological, sociological, and other bases of speech.
- 201. Speech Communication Theories (5).**
The nature, purposes, and process of oral communication. Theories of language, goals of various forms of oral communication are considered. Deviations from normal speech and special problems in communication are explored.
- 202. Applied Speech Communication (3). Lec. 2, Lab. 3.**
To improve the efficiency and effectiveness of oral communication by covering the human organism as an oral communicator, the process of transmission and reception of information, the process of behavioral change and the ethical responsibilities involved.
- 203. Voice and Articulation (3).**
Provides a body of knowledge about voice production and articulation (articulation, pronunciation, and intonation) for persons interested in knowing what the productive act of speaking is about and applying this knowledge to the improvement of their own speech.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. Psychology of Communication (5). Pr., one course in psychology.**
Speech as a psychological phenomenon with consideration of language development, symbolism, verbal learning. Small groups and audience behavior and psychological studies in various areas of communication situations.
- 502. Experimental Methods in Communication (5).**
A survey and analysis of experimental and empirical research in communication with emphasis on experimental designs.
- 508. Special Topics in Speech Communication (1-5). May be repeated but only 5 hours is applicable to the major.**
Examines selected topics in Speech Communication.
- 509. Social Dialects (5).**
Investigates origin and nature of different dialects of American English. Focuses on the characteristics and causes of social dialects and the problems encountered in our society because of their existence. Particular emphasis will be placed on social dialects in Alabama.

GRADUATE

- 601. Introduction to Graduate Study in Speech Communication (5).**
Exploration of areas in which research is needed; resources available, methods of research in speech; structuring the research problem; presenting the results of research in speech.
- 602. Measurement in Communication Research (5).**
Response measurement techniques and their application to behavioral research in communication. Particular attention to attitudinal and electrophysiological phenomena.
- 603-604. Development of Rhetorical Theory I, II (5-5). Pr., consent of instructor.**
Advanced studies in the historical development of writings, men, and movements. Materials selected from the periods: A. Ancient and Medieval; B. Renaissance and Modern.
- 606. Seminar: Studies in Communication Theory (5).**
Contemporary theories and analysis of concepts, models and pertinent research in interpersonal communication. Consideration of selected topics.
- 607. Independent Study (1-5). May be repeated for a maximum of 10 hours credit. Prior written approval required.**
Conferences, readings, research, and reports in one of the listed categories.
- 608. Seminar in Persuasion and Attitude Change (5).**
A critical examination of current theory and research in the area of the persuasive act and its effects. Particular attention to current departmental projects as examples of present research.
- 699. Thesis. (Credit to be arranged.)**

b. Public Address

- 211. Fundamentals of Speech Communication (5).**
Content, organization, style, delivery, adaptation to the audience, ethics, and criticism. Theory and practice, composition and delivery of original speeches.
- 310. Great American Speeches (3).**
Critical study and comparison of representative outstanding American speeches; the issues with which they were identified; their relation to the social scene.

ADVANCED UNDERGRADUATE AND GRADUATE

- 511. Persuasive Speaking (5). Pr., SC 211 or consent of instructor.**
Influencing individuals and audiences by means of spoken appeals. Salesmanship speaking. Analysis of forces which led to belief and action. Practice in organizing and presenting such appeals.
- 515. Black Rhetoric (5). Pr., junior standing.**
Identification of important black speakers in America, understanding of the historical context in which these speakers functioned and a delineation of the persuasive strategies employed.

GRADUATE

- 613. American Public Address I (5).**
Criticism of selected speakers, and speeches, 1750-1880, studied against a background of political, social, and intellectual issues.
- 614. American Public Address II (5).**
Criticism of selected speeches and speakers, 1880 to present, studied against a background of political, social, and intellectual issues.

615. Rhetorical Criticism (5). Pr., consent of instructor.

The history and method of rhetorical criticism. Application of critical standards to selected men and their work.

*c. Interpretation***220. Fundamentals of Oral Interpretation of Literature (5).**

Oral readings of prose, poetry and drama, enhancing the student's understanding and appreciation of the art of literature by engaging him actively in reading the literary text aloud.

ADVANCED UNDERGRADUATE AND GRADUATE**521. Oral Interpretation of Prose (5). Pr., SC 220 or consent of instructor.**

Develops skill in the oral reading of creative prose. Theories concerning the sound, sense, and performance of prose.

522. Oral Interpretation of Poetry (5). Pr., SC 220 or consent of instructor.

Theories concerning problems in reading verse, criticism and performance; modes of group performance are included.

523. Readers Theater (5). Pr., SC 220 or consent of instructor.

Investigates literature appropriate to group performance and treats the techniques of adaptation, compilation, rehearsal and staging of non-dramatic literature.

GRADUATE**620. Development and Theory of Interpretation (5).**

The growth and change of theories regarding oral interpretation.

*d. Mass Communication***230. Introduction to Broadcasting (5).**

The history, growth, and development of broadcast communications and the legal, social, and political aspects of broadcasting.

234. Broadcast Production Techniques—Radio (5). Pr., consent of instructor.

Analysis of the creative efforts and responsibilities in the primary stages of broadcast production. Practice in writing, producing, directing, performing, and crewing radio productions and taped material.

235. Modes of Film Communication (5).

The film industry's contribution to television and other forms of mass communication; an analysis of the styles and forms of film production as entertainment, communication, education and art.

335. Cinema and Society (5). Pr., SC 235 or consent of instructor.

The role of film, its history, contributions and effectiveness as an area of expression and communication; an analysis of the social, artistic, economic and cultural factors which have influenced the film.

336. Television Production—Direction I (5). Pr., consent of instructor.

Individual and group projects in the development and production of programs and formats; and intense study of directing theory and the director's role through presentation of educational and dramatic materials.

337. Film Production I (5). Pr., SC 235 or consent of instructor.

Studies in both theory and principles of film making. Special instruction given through practical application of silent film to the problems of production planning, writing, direction, cinematography, and editing.

338. Broadcast News Writing (5). Pr., consent of instructor.

Writing and editing news and informational materials for television and radio. Students solicit and prepare news from and for local sources.

431-432. Mass Communication Workshop (3-3). Pr., SC 230, 235, 336, and departmental approval.

Experience as a part-time staff member with an approved local station or production company.

ADVANCED UNDERGRADUATE AND GRADUATE**534. Radio Production Techniques II (5). Pr., SC 234 or consent of instructor.**

A continuation of SC 234 with further refining of writing, producing, directing, performing and crewing radio productions and audio taped material.

536. Television Production—Direction II (5). Pr., SC 336.

Individual and group projects in the creation of program material with special emphasis on the writer-producer and his role in the industry.

537. Television Production III (5). Pr., SC 336 and 536 or consent of instructor.

Individual and group projects in the writing and producing of television programs with an emphasis on preparation of graphics, lighting and on-camera talent.

538. Television—Radio—Film Writing (5). Pr., consent of instructor.

The technique of writing dramatic and non-dramatic material for television, radio, and films. Special emphasis is placed on performance. Students may elect to emphasize one area.

539. Mass Communication Internship (6). Pr., SC 230, 235, 336, 431 and departmental approval.

A full-time internship with an approved station or production company; serving as a regular staff member under the supervision of the station manager and direction of an Auburn University faculty member.

GRADUATE**630. Studies in Mass Communication (5). Pr., consent of instructor.**

Combined media and their relationship with speech and communication.

631. Development of American Broadcasting (5). Pr., consent of instructor.

The origin of radio and television broadcasting and its development to the present day.

632. Broadcast Programming and Criticism (5). Pr., consent of instructor.

The theory and practice of programming, its problems and concepts, coupled with an analysis of the criticism leveled at the process and the product.

633. Broadcast Regulations (5).

The social and political control of broadcasting by agencies, groups, and organizations through legal, social, and economic means.

*e. Speech and Audiology**(Speech Pathology)***340. The Speech and Hearing Mechanism (5).**

Anatomy and physiology of the speech and hearing mechanism.

341. Phonetics (3). Lec. 2, Lab. 3.

Principles of phonetics and their application to speech.

350. Introduction to Speech Pathology—Audiology (5).

Survey of the field of speech pathology-audiology. Includes history of the profession, the inter-relatedness of the various pathologies, general principles of evaluation and therapy, and the profession itself.

455. Introduction to Clinical Procedures in Speech Pathology (1). Pr., SC 551 or 552 or equivalent.

Orientation to clinical activities in the area of Speech Pathology. Clinical observation required.

456. Clinical Instrumentation and Test Procedures (1). Pr., SC 455 or equivalent.

Orientation to diagnostic and therapy instrumentation and procedures. Clinical observation required.

457. Therapeutic Procedures in Speech Pathology (2). Pr., SC 456, SC 553, or SC 554 or equivalent.

Introduction to therapeutic methods and program writing. Clinical practice in speech therapy procedures required.

458. Advanced Therapeutic Procedures in Speech Pathology (2). Pr., SC 457, SC 553, and SC 554 or equivalent. May be repeated for credit.

Orientation and an introduction to supervised clinical activity in the area of speech disorders. Clinical practice required.

459. Clinical Speech Practicum in the Public Schools for Education Majors (1). Pr., SC 458. May be repeated twice for credit.

Orientation and an introduction to supervised clinical activity in the area of public school speech and language disorders. Clinical practice required.

ADVANCED UNDERGRADUATE AND GRADUATE**550. Principles of Speech Correction (5).**

Not open to students emphasizing or majoring in speech correction and audiology. Basic principles underlying a speech correction program in a school setting. Description and discussion of speech disorders; surveys and identification techniques.

551. Articulation Disorders (5). Pr., SC 340, SC 341, or equivalent.

Introduction to the principles of normal and deviant articulation acquisition.

552. Language Disorders (5). Pr., SC 340, SC 341, or equivalent.

Introduction to the principles of normal and deviant language acquisition.

553. Fluency Disorders (5). Pr., SC 340, SC 341, or equivalent.

Introduction to the principles of fluent and dysfluent verbal behavior.

554. Vocal Disorders (5). Pr., SC 340, SC 341.

Introduction to the principles of normal and deviant vocal behavior.

GRADUATE

- 650. Clinical Problems in Speech (1-3). Pr., SC 455-458 series or consent of instructor. May be repeated for credit.**
Methods, techniques, and clinical management of the disorders of speech. Clinical practice required.
- 651. Articulation Disorders (4). Pr., SC 551 or consent of instructor.**
Empirical and theoretical bases for articulatory pathologies, diagnoses, and therapies.
- 652. Language Disorders (4). Pr., SC 552 or consent of instructor.**
Empirical and theoretical bases for language pathologies, diagnoses, and therapies.
- 653. Fluency Disorders (4). Pr., SC 553 or consent of instructor.**
Empirical and theoretical bases for dysfluency disorders, diagnoses, and therapies.
- 654. Voice Disorders (4). Pr., SC 554 or consent of instructor.**
Empirical and theoretical bases for voice pathologies, diagnoses, and therapies.
- 655. Disorders Associated With CNS Pathologies. (4). Pr., SC 552 or consent of instructor.**
Empirical and theoretical bases for speech/language disorders associated with CNS pathologies, diagnoses, and therapies.
- 656. Cleft Palate (4). Pr. SC 551 or consent of instructor.**
Empirical and theoretical bases for speech/language pathologies associated with cleft palate, diagnoses, and therapies.
- 657. Seminar in Speech Pathology. Credit to be arranged. Pr. SC 551, 552, 553, 554, or consent of instructor. May be repeated for credit with change in topics.**
Advanced treatment of contemporary topics and trends, as well as current research aspects of speech pathology.
- 658. Field Experience in Speech Pathology (5-10). May be repeated for a maximum of 10 hours credit. No more than 5 hours may be used for minimum requirements toward a master's degree.**
Full-time assignment in a speech and hearing facility, the choice being made from the following settings: University Speech and Hearing Clinic, hospital, public school, and various community agencies serving speech- and hearing-impaired children and adults.

(Audiology)

- 465. Introduction to Clinical Procedures in Audiology (1). Pr., SC 560 or equivalent.**
Audiological instrumentation and test procedures. Clinical observation in audiological procedures required.
- 466. Audiological Evaluation Procedures (2). Pr., 465 and 561 or equivalent.**
Procedures in audiometric evaluations. Clinical practice in audiological procedures required.
- 467. Advanced Audiological Evaluation Procedures (2). Pr., SC 466 and 562 or equivalent. May be repeated for credit.**
Procedures in hearing evaluations, hearing aid evaluations, and aural rehabilitation.

ADVANCED UNDERGRADUATE AND GRADUATE

- 560. Introduction to Audiology (5).**
Principles of auditory reception, the hearing mechanism and the problems involved in measuring, evaluating, and conserving hearing. Clinical observation.
- 561. Hearing Pathology (5). Pr., SC 560 or equivalent.**
Evaluation and rehabilitation of aural handicapped children and adults; hearing aids and hearing training. Clinical practice.
- 562. Hearing Evaluation, Rehabilitation and Conservation (5). Pr., SC 561 or consent of instructor.**
Detailed concern for the rehabilitation problems of children and adults in the area of auditory training, speech reading and speech conservation. Clinical practice.
- 660. Clinical Problems in Hearing (1-4). Pr., SC 560, 561, 562, or consent of instructor. May be repeated for credit.**
Methods, techniques, and clinical management of the disorders of hearing. Clinical practice required.
- 661. Pediatric Audiology (4). Pr., SC 560, 561, 562, or consent of instructor.**
Etiologic factors, screening, audiologic assessment, differential diagnosis, and clinical management of infants and children with hearing disorders.

- 662. Advanced Clinical Audiology I (4). Pr., SC 560, 561, 562, or consent of instructor.**
Audiometric calibration, instrumentation, and physical requirements for audiometry. Introduction to advanced audiometric techniques, with an emphasis on evaluation of the peripheral auditory system.
- 663. Advanced Clinical Audiology II (4). Pr., SC 560, 561, 562, or consent of instructor.**
Continuation of SC 662. Advanced techniques in differential diagnosis of auditory function emphasizing assessment of pseudohypacusis, the central auditory system and the use of physiologic methods.
- 664. Aural Rehabilitation (4). Pr., SC 560, 561, 562, or consent of instructor.**
Clinical and therapeutic management of persons with hearing disorders, including selection and use of individual and group amplifying systems and electro-acoustic measurement of hearing aid performance.
- 665. Industrial Audiology (4). Pr., SC 560 or consent of instructor.**
Measurement and control of environmental noise, industrial audiometry, medico-legal aspects, and conservation of hearing.
- 666. Hearing Science (4). Pr., SC 560, 561, 562, or consent of instructor.**
Review of the layout of the auditory pathways, instrumentation, psychoacoustics and electrophysiology of the auditory system, as well as literature related to normal audition.
- 667. Seminar in Audiology. Credit to be arranged. Pr., SC 560, 561, 562, or consent of instructor. May be repeated for credit with change in topics.**
Advanced treatment of contemporary topics and trends, as well as current research aspects of audiology.
- 668. Field Experience in Audiology (5-10). May be repeated for a maximum of 10 hours credit. No more than 5 hours may be used for minimum requirements toward a master's degree.**
Full-time assignment in a speech and hearing facility, the choice being made from the following settings: University Speech and Hearing Clinic, hospital, public school, and various community agencies serving speech- and hearing-impaired children and adults.

f. Group Communication

- 273. Group Problem Solving Through Discussion (5).**
Group problem solving through discussion. The values and limitations of discussion, the prerequisites of reaching agreement, and a systematic approach to solving problems in group discussion. Leadership in problem solving.
- 275. Debate Workshop (1). May be repeated for a maximum of 3 credit hours.**
Introduction to the national debate question for beginning debaters interested in competition debate. Lecture and practical work.
- 278. Argumentation and Debate (5).**
Debating techniques and procedures; their application to issues of current public interest; the gathering, organization, and presentation of facts, proofs, evidence.
- 371. Parliamentary Procedure (3).**
To aid the individual who may lead or participate in discussions or organizations where orderly procedure is needed. Theory and practice both employed.
- 375. Debate Workshop (1). May be repeated for a maximum of 3 credit hours.**
Advanced study of the national debate question for experienced debaters. Analysis of logical, ethical and emotional proofs in competition debate. Lecture and practical work.

ADVANCED UNDERGRADUATE AND GRADUATE

- 578. Directing Forensics (5).**
An examination of the various philosophies of forensic programs, a study of representative forensic situations and of leading theorists.

GRADUATE

- 672. Seminar in Discussion (Process) (5).**
Explores the dynamics of group decision-making, including the communication process and ways to improve interpersonal communication necessary to group decision-making through increased awareness, encounter, transactional analysis, and values clarification.
- 673. Seminar in Discussion (Content) (5). Pr., SC 672 or consent of instructor.**
Explores the ways a group can resolve its differences over fact, reasoning, and values. Students participate in group decision-making and analyze their experience in an effort to increase their ability to resolve difficulties with group process and resolve differences over content.
- 678. Seminar in Argumentation and Debate (5).**
Systems of argumentation as inquiry and advocacy; studies of debate as a decision making procedure; representative argumentation theorists and leading practitioners.

Technical Services (TS)

Professor Haynes, *Head*

Associate Professors Blakney, McClung, Goolsby, and Thornton

Assistant Professors Clement, Conner, McMurtrey, and Wingard

100. **Introduction to Manufacturing Processes (2). Lec. 1, Lab. 2.**
Laboratory oriented studies in economic production principles related to metal and plastic product manufacturing.
102. **Graphical Communication & Design (2). Lab. 6.**
Graphical technique and projective geometry relating to spatial visualization and communication in design.
104. **Descriptive Geometry (2). Lab. 6. Pr., TS 102.**
Basic principles pertaining to point, line and plane, including development problems.
105. **Engineering Drawing II (2). Lab. 6. Pr., TS 102.**
Advanced phases of graphical techniques and conventions including technical sketching.
107. **Graphical Analysis and Design (2). Lab. 6. Pr., TS 102.**
Application of orthographic projection principles in solving engineering problems.
108. **Design for Management (2). Lab. 6 Pr., TS 102, 107 or equivalent.**
Fundamental graphical concepts relative to management activities including design and communication.
111. **Woodworking (1). Lab. 3.**
Introduction to machines, tools, and materials used in working with wood and plastic.
112. **Welding Science and Application (1). Lab. 3.**
Basic principles and application of welding and cutting processes in the fabrication of metals.
113. **Machine Tool Laboratory (1). Lab. 3.**
Introduction to metal removal processes; basic machines of production.
114. **Sheet Metal Design and Fabrications (1). Lab. 3.**
Methods and equipment used in design, production and fabricating of sheet metal products.
115. **Foundry Technology (1). Lab. 3.**
Basic fundamentals involved in casting products of ferrous and non-ferrous metals.
204. **Kinematics of Machines (3). Lec. 2, Lab. 3. Pr., TS 104, 105 and PS 220. Spring.**
Graphical analysis of machine elements including velocity diagrams.
216. **Plastics Technology (2). Lec. 1, Lab. 2. Pr., TS 100 or equivalent.**
Laboratory oriented course in material and processes of plastic products.
307. **General Metals (5). Lec. 3, Lab. 4. Pr., consent of instructor.**
Design, construction and finishing art metal projects.
308. **Gages and Measurements (5). Lec. 4, Lab. 2.**
The science of measurement as applied to production and inspection of industrial products.
402. **Advanced Woodworking (5). Lec. 3, Lab. 4. Pr., TS 111.**
Studies in design, construction, and finishing fine objects of wood.
403. **General Shops (5). Lec. 5. Pr., senior standing.**
Problems of organization of unit shops into integrated whole for effective use in secondary school teaching.
405. **Problems in Welding Engineering (5). Lec. 3, Lab. 4. Pr., TS 112.**
Advanced phases and techniques of welding and allied processes. Problems in design, weldability of metals, inspection practice, and selection of equipment.
406. **Problems in Machining (5). Lec. 3, Lab. 4. Pr., TS 113.**
Advanced phases of metal machining with emphasis on production machines and accessories.

ADVANCED UNDERGRADUATE AND GRADUATE

515. **Shop Work for Elementary Teachers (5). Lec. 2, Lab. 6.**
Methods, materials, and techniques involved in conducting activity programs in schools and recreational centers.
516. **Materials of Industrial Arts (5). Lec. 5. Pr., senior standing.**
History and use of various materials used in industry.
517. **Organization of Shop Courses (5). Lec. 5. Pr., senior standing.**
Organization and administration of the Industrial Arts program in the public schools.
518. **Industrial Arts Design (5). Pr., senior standing.**
Fundamentals of design as applied to Industrial Arts programs.
550. **Engineering Metrology (1-5). Pr., departmental approval.**
Studies in design, construction, and use of precision measuring equipment and gages.

GRADUATE

611-612. Technical Problems in Industrial Arts (5-5). Pr., graduate standing.

Advanced study of technology and methods in selected areas of Industrial Arts, Trade and Technical Education.

Textile Engineering (TE)

Professors Lynch, Head, Knight, and Waters

Associate Professors Hall, and Walker

Assistant Professor Perkins

101. Introduction to Textiles (1).

Orientation course for freshmen which briefly introduces all branches of the textile industry.

210. Fiber Processing (5). Lec. 4, Lab. 2.

Construction and operation of equipment for opening, cleaning, blending, picking, carding, combining, drawing, adaptation of these processes to synthetics and wool; calculations necessary for the planning and operation of this equipment.

211. Yarn Manufacture I (5). Lec. 4, Lab. 2. Pr., TE 210.

Construction and operation of roving and spinning equipment for cotton, wool, and synthetics long draft systems and drafting, systems for blends, etc.

220. Weaving and Designing I (5). Lec. 4, Lab. 2.

Automatic cam loom mechanism with design of fabrics made on these looms.

230. Basic Fabric Structure and Design (5). Pr., sophomore standing.

The formation of cloth on basic loom mechanisms is presented prior to the study of fabric design, construction and identification. Special fabrics through the use of color, finishes and weaves are covered.

250. Tufted Carpet Fundamentals (2).

Terminology and basic principles involved in tufted carpet manufacturing. Comprehension of machinery components involved and surface design of finished carpet.

305. Fiber Technology (3). Lec. 2, Lab. 2. Pr., sophomore standing.

Origin, characteristics, and properties of the various textile fibers, both natural and man-made, fiber microscopy.

307. Bleaching and Dyeing (5). Lec. 4, Lab. 2.

Bleaching, dyeing and finishing of natural and man-made fiber fabrics; all types of dyes for textiles, their application and fastness.

317. Dyeing and Finishing (5). Lec. 4, Lab. 2. Pr., TE 307.

Plant application methods and plant problems in dyeing, finishing and printing of natural and man-made fibers.

319. Chemical Testing (2). Lec. 1, Lab. 2. Pr., junior standing.

Theory and practice of testing of textile materials by chemical means; physical tests related to chemical properties, qualitative and quantitative analysis of textile materials.

320. Weaving and Designing II (5). Lec. 4, Lab. 2. Pr., TE 220.

Dobby and multibox operation, pattern planning, and designs applicable to dobby and box looms.

321. Weaving and Designing III (5). Lec. 4, Lab. 2. Pr., TE 320.

Special weaving attachments, and production of specialty fabrics. Weaving mill organization. Fabric identification.

323. Yarn Manufacture II (3). Lec. 2, Lab. 2. Pr., TE 210 and 211.

Methods of obtaining higher quality yarns; yarn production planning; practical manufacturing problems; yarn mill machinery layout and labor organization.

324. Physical Testing (3). Lec. 2, Lab. 2. Pr., TE 210 and 211.

Basic principles for measuring properties of natural and man-made fibers, yarns, and fabrics with use of laboratory testing equipment for familiarization with test methods.

325. Textile Quality Control (2). Pr., TE 210, TE 211, EC 274; coreq., TE 324.

The practical use of statistics and quality in the textile industry with emphasis on statistical control techniques.

340. Introduction to Knitting (3).

Terminology and basic principles involved in knit fabric manufacturing. Development of basic skills in knit fabric designing and application of designs to knitting equipment.

408. Warp Preparation (3). Pr., junior standing.

Spooling, warping, and slashing of natural and synthetic yarns; chemistry of starches and synthetic polymers used as warp sizes; analysis of problems associated with preparation of warp yarn for weaving.

406. Textile Costing (5). Pr., junior standing.

Basic principles for figuring textile production costs; allocation of costs; fabric cost sheet; marketing costs.

412. Textile Management (3). Pr., senior standing.

A practical business management approach to the analysis and solution of problems in the textile industry. The major areas of concern to management are discussed, including policy determination, organization structure and analysis, employment function, manpower development, financing, purchasing, production, merchandising, industrial and public relations, etc.

417. Advanced Dyeing (5). Lec. 4, Lab. 2. Pr., TE 317.

Survey of major dye classes from a chemical standpoint: basic principles of color, color specification, color matching, and instrumentation; thermodynamic and kinetic study of the dyeing process.

418. Jacquard Weaving and Design (2). Lec. 1, Lab. 2. Pr., TE 220.

Jacquard mechanism and design of original patterns for jacquard loom.

424. Man-Made Fibers I (5). Pr., junior standing.

An introduction to the more important man-made fibers and polymer forming substances, and their considerations in the employment in fibers and blends.

425. Man-Made Fibers II (5). Pr., TE 424.

A continuation of TE 424. A further study of the relationships between fiber structure and geometry, and technological aspects on their properties and uses.

431. Fabric Analysis (3). Lec. 2, Lab. 2. Pr., TE 320.

Analysis of fabric structure and determination of specifications.

Theatre (TH)

Professor Harrison, *Head*

Associate Professor Comeau

Assistant Professors Brooks, Miller, and Patterson

Instructor Koellsted

100. Theatre Convocation (0). All quarters. Required of all theatre majors each quarter.

Performance, lectures, and discussions by faculty, guest artists, and students.

104. Introduction to Theatre I (3).

Theatre as an art form, involving history and crafts of theatre and the solution of simple problems in acting and design.

105. Introduction to Theatre II (3). Pr., TH 104.

Theatre as an art form, involving the analysis and oral interpretation of dramatic literature.

106. Introduction of Theatre III (3). Pr., TH 104, 105.

Theatre as an art form, involving the exploration and beginning development of the voice and body as instruments of the theatre.

107. Stage Craft I (1). Lab. 4.

An introduction to technical theatre as the craft of scene construction. Weekly laboratory work, with a minimum of 30 hours during a quarter under staff supervision.

108. Stagecraft II (1). Lab. 4. Pr., 107.

An introduction to technical theatre as the craft of costumes and make-up. Weekly laboratory work, with a minimum of 30 hours during a quarter under staff supervision.

109. Stage Craft III (1). Lab. 4. Pr., 107, 108.

An introduction to technical theatre as the craft of lighting and electronics.

111. Theatre Practice (1). Lab. 3.

For students selected by faculty directors for work in University Theatre activities. One hour's credit in any field of theatre—acting, directing, technical production, design, or theatre management—in any one quarter. Total credit allowed: six hours. Work completed in this course must be exclusive of laboratory hours required in other theatre courses.

199. Theatre Laboratory (2). Lab. 6. Pr., 109.

General laboratory work (a minimum of 45 hours under staff supervision during a quarter). A course open to students who have completed Stage Craft sequence and who are interested in working on the theatre season of the Department in any production capacity. May be repeated for a maximum credit of six quarter hours.

201. Contemporary American Theatre (3). Pr., 2nd year standing.

An examination of the history of professional theatre in the U.S. and the development of regional and educational theatre.

203. Theories of Acting (3).

The theoretical aspects of acting to include writings from the time of Aristotle to the present day.

204. Acting Fundamentals I. (5). Lab. 10.

Developing the voice as a performing instrument.

- 205. Acting Fundamentals II. (5). Lab. 10. Pr. TH 204.**
Developing the body as a performing instrument.
- 206. Acting Fundamentals III. (5). Lab. 10. Pr., 204, 205, or equivalent.**
Developing the integrated use of voice and movement as performing instruments in building characterizations in short acting sequences.
- 207. Stage Make-up (3) Lab. 4.**
A practical course in the design and application of theatrical make-up for stage purposes.
- 210. Theatre as Entertainment (5). Lec. 4, Lab. 2. Pr., sophomore standing. Not open to Theatre majors.**
Developing the student's awareness of theatre through involvement in the processes and materials used by various performing arts: theatre, film, television, music, and dance.
- 221. Advanced Technical Production (3). Pr., TH 107, 108, 109.**
Stagecraft with emphasis on the various physical forms of theatre, and the construction, rigging, handling of scenery, and machinery for each.
- 301. Theatre in Western Civilization (3).**
The theatre as literature, institution, and architecture as it has existed from earliest times to the end of the medieval period.
- 302. Theatre in Western Civilization (3). Pr., 301.**
The theatre as literature, institution, and architecture as it has existed in Western culture from the end of the medieval period until the mid-nineteenth century.
- 303. Theatre in Western Civilization (3). Pr., 301, 302 or equivalent.**
The theatre as literature, institution, and architecture in Western civilization from the mid-nineteenth century to the present day with emphasis on theatre in America.
- 304. Fundamentals of Stage Design (5). Lab. 6. Pr., 3rd year standing.**
The basic considerations involved in all aspects of the performer's stage environment.
- 305. Design in the Theatre I (3). Lab. 6. Pr., 304 or equivalent.**
A continuation of fundamental design concepts with emphasis on stage lighting.
- 306. Design in the Theatre II (3). Lab. 6. Pr., 304, 305 or equivalent.**
Practice in stage design.
- 307. Children's Theatre (3).**
Theatre for children involving an examination of play scripts, acting, and production techniques.
- 308. Creative Dramatics (3).**
Leadership principles in creative dramatics; story materials and their adaptation to children's needs; techniques for guiding, planning, leading, and evaluating improvised drama; emphasis on creative dramatics as a learning tool in the classroom.
- 309. Costume (3).**
The design and construction of elementary stage costumes.
- 310-311-312. Dramatic Production (3-3-3). Only students approved by the department head may register for these courses.**
For advanced work on an individual project in acting, scene design, costume design, directing, sound design, choreography, or any major production problem approved by the Theatre faculty. A maximum of six hours credit may be earned in Dramatic Production but only three hours each in acting, directing, design, etc.
- 315. Recreational Dramatics (3).**
Fundamentals of amateur theatrical production: techniques of staging, simple scenery, costuming, lighting, and make-up. Basic techniques of directing and acting for teacher, club, and recreation leader.
- 321. Costume History (3). Pr., 3rd year standing.**
The history of clothing in Western Civilization from the ancient Egyptians to the present, with special emphasis upon theatrical uses of styles and accessories.
- 322. Costume Design (3). Lab. 6. Pr., 321.**
The basic considerations involved in all aspects of the performer's stage dress, with particular stress on designing for Shakespearean plays, opera, and contemporary musical comedy.
- 323. Costume Patterning and Construction (3). Lab. 6. Pr., 321, 322.**
A continuation of costume design, with emphasis on working from prepared patterns, drafting original patterns, and selecting fabrics, trims, and accessories.
- 326. Stage Lighting (3). Lab 6.**
Introduction to stage lighting and operation of the light control board. Survey of the history, nature, and control of light in the theatre through color media, reflection, refraction, and dimmers. Assignments and practice in Auburn University Theatre productions.
- 331. Summer Theatre Rehearsal and Performance (5). Pr., 3rd year standing.**
Theoretical and practical study in analyzing and performing dramatic characters. Designed for individual artistic development through acting opportunities in rehearsals and performance of major play productions.
- 332. Summer Theatre Management (5). Pr., 3rd year standing.**
Intensive practical participation in non-technical production planning, box office procedures, publicity preparation, and stage management applied in major play production.

- 401. Play Analysis (3). Pr., 4th year standing.**
An examination of playscripts emphasizing interpretation from the viewpoint of directorial theory
- 403. Seminar and Theatre Research (3).**
The past and present patterns of research in all areas of theatre and practice
- 404. Directing Fundamentals I (3). Lab. 4.**
Introduction to basic theory and technique of directing theatre productions
- 405. Directing Fundamentals II (3). Lab. 6. Pr., TH 401, 404.**
A continuation of 404 involving practical exercises in directing.
- 406. Directing Fundamentals III (3). Lab. 6. Pr., TH 405.**
Provides the student with several directing problems which must be solved through the completion of a directing project. Prerequisites 404, 405 or equivalents.
- 407. Advanced Acting (5). Lab. 10. Pr., TH 206.**
Developing the various specialized performance and vocal techniques required for acting dramas from the major periods preceding the twentieth century.
- 408. Problems in Aesthetic Design (5). Lab. 10. Pr., 304, 305, 306, or equivalent.**
An intensive study of stage design problem solving based on the works of design theoreticians of the twentieth century.
- 409. Advanced Directing (3). Pr., 404, 405, or equivalent.**
Directing theory based on the detailed analysis of the work and writings of selected twentieth century directors.
- 410-411-412. Dramatic Production (3-3-3). Only students approved by the department head may register for these courses.**
For advanced work on an individual project in acting, scene design, costume design, directing, sound design, choreography, or any major production problem approved by the Theatre faculty. A maximum of six hours credit may be earned in Dramatic Production but only three hours each in acting, directing, design, etc.
- 414. Modern Theatre Backgrounds (3).**
The leading artists, concepts, and movements in Continental theatre which have affected playwriting and play production in the twentieth century.
- 427. Introduction to Theatre Management (5).**
An introduction to the field of theatre management with emphasis on elementary procedures involving sales and advertising management.
- 431. Summer Theatre Production (5). Pr., 3rd year standing.**
Intensive experience in all phases of technical theatre production through participation in scenic construction, lighting, sound, and costuming in the production of major plays.
- 432. Scene Painting (3). Pr., TH 304, 305, 306.**
Introduction to painting for the stage, with emphasis on materials, texturing techniques, and three-dimensional effects.

Veterinary Medicine (VM)

Anatomy and Histology

Professors Holloway, *Head*, McKibben

Associate Professor Krista

Assistant Professors Gray, Reynolds, Brown, and Rumph

Instructors Cartee, Mills, and Vaden

Microbiology

Professors Kramer, *Head*

Associate Professors Attleberger, Rossi, Swango, and Swann

Adjunct Associate Professor Klesius

Assistant Professors Kristensen and Kristensen

Instructor Tsai

Adjunct Instructors Westergaard and Younger

Pathology and Parasitology

Professors Groth, *Head*, Morgan, Roberts, Cottier, and Bailey
Associate Professors Benz, Hoff, Powers, Teer, Miller, and Stowe
Assistant Professors Diamond, Giles, and Spano
Adjunct Associate Professors Ernst and Frandsen
Instructors Higgins and Warren

Physiology and Pharmacology

Professors Clark, *Head*, Redding, Beckett, and Burns
Associate Professor Robertson
Assistant Professors Nachreiner, Branch, Pedersoli, and Sims
Graduate Teaching Assistants Boyd, Schachter, Boozer, Sheeley, and Ricketson

Radiology Section

Associate Professor Bartels
Assistant Professor Boring
Instructors Quick and Brawner

Large Animal Surgery and Medicine

Professors Vaughan, *Head*, Kiesel, Walker, and Wiggins
Associate Professors, Hudson, Kjar, Winkler, Humburg, and Hoover
Assistant Professors Powe, Sharman, and Purohit
Instructors McCoy, Firth, B. Hudson, Jagar, Jones, and Young
Interns Alford, Bergfeld, and Singleton

Small Animal Surgery and Medicine

Professors Hoerlein, *Head*, Horne, and Redding
Associate Professor Hankes
Assistant Professors Albert, Milton, Swaim, Wiggins, Jones, and Vanderelde
Instructors August, Wilder, Henderson, Dillon, Greene, Kasper, and Walker
Adjunct Instructor Barsanti
Resident Veterinary Surgeon Bushby
Interns Barkman, Raffae, and Sorjonen

Veterinary Medicine (VM)

Following this section of Veterinary Medicine Course Descriptions, the remaining VM courses are listed under their alphabetically arranged departments.

- 300. **Orientation (2). Fall.**
Dynamics of professional responsibilities, duties and privileges of the veterinarian.
- 313. **Physiology I (3). Lec. 3. Fall.**
Cell Physiology.
- 313L. **Physiology Laboratory I (1). Lab. 2. Fall.**
Experiments on cell physiology and endocrinology.
- 314. **Physiology II (3). Lec. 3. Pr., VM 313-313L. Fall.**
Endocrinology.

- 315. Physiology III (2). Lec. 2. Pr., VM 314. Winter.**
Gastrointestinal and liver physiology—radiation biology.
- 315L. Physiology Laboratory II (2.) Lab. 4. Winter.**
Experiments on the reproductive, cardiovascular, and digestive systems.
- 316. Physiology IV (2). Lec. 2. Pr., VM 315-315L. Winter.**
Physiology of the Reproductive System.
- 317. Physiology V (2). Lec. 2. Pr., VM 315-315L. Winter.**
Blood, electrocardiology and respiration.
- 318. Physiology VI (4). Lec. 4. Spring.**
Cardiovascular and renal physiology.
- 318L. Physiology Lab. III (1). Lab. 2. Spring.**
Physiology and Pharmacology experiments on the cardiovascular system.
- 319. Pharmacology I (2). Lec. 2. Pr., VM 318. Spring.**
Introductory pharmacology.
- 320-321-322. Anatomy I, II, III (5-5-5). Lec. 2, Lab. 10. Fall, Winter, Spring.**
Gross anatomy of domestic animals. A progressive study of the gross structures of the dog, cat, ox, horse, hog, fowl, laboratory animals, and zoo animals.
- 326. Microscopic Anatomy I (5). Lec. 2, Lab. 5. Fall.**
Microscopic anatomy of the form, structure, and characteristics of the basic tissues of animals.
- 327. Microscopic Anatomy II (5). Lec. 2, Lab. 6. Pr., VM 326. Winter.**
Microscopic anatomy of the tissue, composition of organs and organ systems.
- 328. Microscopic Anatomy III (4). Lec. 2, Lab. 4. Pr., VM 327. Spring.**
Microscopic anatomy of the reproductive organs. Formation and early development of the embryos of domestic animals. Fetal membranes and placentation are emphasized.
- 331. Veterinary Microbiology I (4). Lec. 2, Lab. 4. Spring.**
Veterinary immunology for students in Veterinary Medicine.
- 401. Pharmacology II (3). Lec. 2, Lab. 2. Pr., VM 319. Fall.**
Pharmacology of general anesthetics.
- 402. Pharmacology III (4). Lec. 3, Lab. 2. Pr., VM 401. Winter.**
Systematic pharmacology.
- 403. Physiology VII (4). Lec. 3, Lab. 2. Pr., VM 318-319. Fall.**
Neurology, respiratory physiology and the pharmacodynamics of drugs affecting the central nervous system.
- 404. Physiology VIII (3). Lec. 2, Lab. 2. Pr., VM 403. Winter.**
Neurology, and the pharmacodynamics of drugs affecting the central nervous system.
- 405. Pathology I (6). Lec. 4, Lab. 4. Pr., VM 322 and VM 328. Fall.**
Disease processes affecting animals with emphasis on the gross and microscopic changes in cells, tissue organs, and systems.
- 406. Pathology II (5). Lec. 3, Lab. 4. Pr., VM 405. Winter.**
Continuation of VM 450.
- 407. Pathology III (4). Lec. 3, Lab. 2. Pr., VM 406. Spring.**
Continuation of VM 451.
- 408. Laboratory Animal Medicine (3). Lec. 2, Lab. 2. Pr., VM 405 and VM 406. Spring.**
Management, utilization, and disease of the common laboratory mammals including rats, mice, guinea pigs, hamsters, rabbits, and nonhuman primates.
- 409. Veterinary Parasitology I (4). Lec. 3, Lab. 2. Fall.**
Introduction to parasitology including internal and external parasites of domestic animals.
- 410. Veterinary Parasitology II (5). Lec. 4, Lab. 2. Pr., VM 409. Winter.**
Continuation of VM 456.
- 411. Veterinary Microbiology II (6). Lec. 3, Lab. 6. Pr., VM 331. Fall.**
Bacteriology and Mycology of Veterinary Pathogens.
- 412. Veterinary Microbiology III (5). Lec. 3, Lab. 4. Pr., VM 331 and VM 411. Winter.**
Veterinary Virology and Rickettsiology.
- 413. Veterinary Public Health I (4). Lec. 3, Lab. 2. Spring.**
Principles of epidemiology, selected diseases of animals transmissible to men and the relationship of the veterinarian to public health and animal disease control agencies.
- 414. Veterinary Medicine I (5). Lec. 5. Spring.**
Detailed study of etiology, symptoms, pathogenesis, diagnosis, treatment, and prevention of the medical diseases affecting the various systems and organs of the equine, bovine, ovine and porcine species.

420. **Veterinary Medicine II (5). Lec. 5. Fall.**
Continuation of VM 499 and includes nutritional deficiency diseases.
421. **Veterinary Surgery I (3). Lec. 3. Fall.**
Background of surgery; major surgical injuries—wounds, fluid loss and infection; preoperative and postoperative care; surgical techniques; anesthesia; and extirpative, reconstructive and physiologic surgery.
422. **Veterinary Surgery II (3). Lec. 3. Winter.**
Special surgical diseases of the domestic farm animals including surgery of the alimentary canal, the chest and abdomen, the respiratory and cardiovascular systems, the eye and ear, the genito-urinary tract, and the feet and limbs.
423. **Clinical Pathology (4). Lec. 2, Lab. 4. Pr., VM 407. Winter.**
Methods for the collection, preservation and examination of various body fluids including blood and urine. Interpretation of results is directed toward clinical diagnosis and prognosis.
424. **Veterinary Medicine & Surgery I (5). Fall.**
The diagnostics, medical and surgical treatment of the gastrointestinal, genitourinary, cardiovascular, pulmonary, and integumentary systems of small domestic animals.
425. **Veterinary Medicine & Surgery II (5). Pr., VM 424. Winter.**
The diagnostics, medical, and surgical treatment of the endocrine, musculo-skeletal, nervous systems and the special sense organs in small domestic animals.
426. **Veterinary Surgery III (1). Lab. 2. Pr., VM 424. Winter.**
Introductory laboratory on basic surgical asepsis, anesthesia, and techniques.
427. **Veterinary Medicine & Surgery III (3). Lec. 3. Pr., VM 424-425. Fall.**
The systemic diseases and clinical immunologic procedures in small domestic animals.
428. **Diagnostic Clinics I (1). Lab. 2. Fall.**
Demonstration and application of principles and techniques of physical diagnosis of large animals.
429. **Clinics VI (2). Lec. 2, Lab. 2. Fall.**
Demonstration and practice of handling, restraint, physical diagnosis, and administration of therapeutic agents related to small animals.
430. **Veterinary Jurisprudence and Ethics (2). Winter.**
Laws relating to the veterinary profession. Professional ethics for the veterinarian.
431. **Veterinary Radiology (3). Lec. 3. Fall.**
Basic diagnostic radiology including interpretations, techniques, therapy and equipment.
433. **Therapeutic Clinics I (1). Lab. 2. Winter.**
Demonstration and application of therapeutic techniques and procedures for large animals.
434. **Applied Anatomy (1). Lab. 2. Winter.**
Anatomy related to diagnostic, obstetrical, and surgical procedures.
435. **Theriogenology (4). Lec. 5. Spring.**
Clinical application of the physiology of reproduction, causes and correction of dystocia, genital examinations, and infertility of the male and female.
436. **Special Anatomy (1 to 5). Hours and credit to be arranged. Pr., VM 320.**
Elective course in which any phase of anatomy of domestic animals to the anticipated field of specialization may be studied.
437. **Veterinary Medicine III (5). Summer.**
Identification and study of selected poisonous plants of the U.S. and common chemical and venom poisoning of farm animals and pets. To include characteristic signs, lesions, methods of diagnosis, and treatment.
- 438-439. **Veterinary Medicine IV, V (4-5). Winter, Fall.**
Principal infectious diseases of large domestic animals. Epizootiology, etiology, clinical signs, diagnosis and diseases control including immunization and sanitation.
- 440-441-442-443. **Clinics VII, VIII, IX, X (6-6-6-6). Spring, Summer, Fall, Winter.**
Conferences, laboratory exercises, and practice in diagnosis, control, and therapy of diseases of small domestic animals.
- 444-445-446-447. **Clinics and Large Animal Surgery and Theriogenological Exercises II, III, IV, V (6-6-6-6). Lab. (12-18-17-18). Spring, Summer, Fall, Winter.**
Conferences, laboratory exercises, and practice in diagnosis, control, and therapy of diseases and surgical procedures for large domestic animals.
- 448-449-450. **Veterinary Surgery IV, V, VI (1-1-1). Lab. 2. Spring, Summer, Fall.**
Detailed consideration and performance of advanced small animal surgery.
451. **Veterinary Public Health II (2). Lec. 2. Pr., VM 411. Winter.**
Principles and methodology of food hygiene including meat, milk, poultry, and other foods related to animal and human health.
452. **Veterinary Public Health III (2). Lec. 2. Pr., VM 451. Winter.**
A continuation of VM 579.

453. Seminar (2). Each quarter.

Literature reviews or research problems selected by the student. Papers written and oral presentation given before his class and faculty.

454. Preceptorship (0). Spring. Non-credit required course.

Completion of satisfactory preceptorship during the spring quarter is required for graduation.

ELECTIVES**460. Introductory Clinics (1-2). Lab. 4.**

Introduction to the clinical practice of large and/or small animal medicine.

461-462-463-464. Special Projects in Microbiology (2). Lab. 4. Pr., consent of instructor. Any quarter by arrangement.

In-depth studies in bacteriology, mycology, immunology, virology, in public health, according to interest of student and instructor involved.

465. Clinical Pharmacology (2). Lab. 4. Pr., 4th year, Winter.

A review of pharmacodynamics, therapeutic indications, and dosages of drugs currently used in clinical practice. In addition, new drugs released for veterinary use within the last 2 years will be studied.

466. Histological Techniques (2). Lab. 4. Pr., VM 326, 327. Max. 10 students. Winter, Summer.

Techniques employed in the preparation of cytological and histological materials.

467. Advanced Small Animal Orthopedic Surgery (2). Lab. 4. Pr., 4th yr. Max. 30. Winter.

Divided into 5 week segments. The first segment deals with repair of various traumatic or congenital disorders in long bones while the last 5 weeks deal with these disorders occurring in joints.

468. Advanced Clinical Small Animal Endocrinology (2). Lab. 4. Pr., 4th yr. Max. 25.

The laboratory diagnosis and management of clinical endocrine diseases of small animals.

469. Electrocardiography (1). Lab. 4. Max. 12.

Clinical application of ECG including methods, techniques, and interpretation recordings.

470. Advanced Small Animal Anesthesia and Intensive Care (1). Lab. 4. 5 weeks. Pr., 4th yr. Max. 20. Winter.

The assessment of body functions and treatment of abnormalities occurring during surgical anesthesia, and intensive care associated with the critical patient.

471. Equine Hospital Practice (1). Lab. 4. 5 weeks. Max. 6. Fall, Winter.

General surgery and clinical procedures conducted in a hospital clinic, including soft tissue and orthopedic surgery and clinical diagnostic techniques.

472. Advanced Bovine Surgery (1). Lab. 4. 5 weeks. Pr., VM 422, Bovine Clinic—may be currently enrolled. Max. 8. Summer, Fall, Winter.

Surgical exercises and indepth study of conditions requiring surgical corrections in bovine.

473. Advanced Theriogenology (1). Lab. 4. 5 weeks. Pr., VM 435 and passage of pretest. Max. 10. Summer, Fall, Winter.

Clinical experience in the management of reproductive problems of livestock, male and female.

474. Equine Field Practice (1). Lab. 4. 5 weeks. Max. 8. Fall and Winter.

General surgery and clinical techniques as conducted in an ambulatory or field practice, including physical diagnosis, preventive medicine and field surgery—both soft tissue and orthopedic surgery.

475. Dairy Herd Practice Problems. (1) Lec. 1, Lab. 2. 5 weeks. Max. 8. Summer, Fall, Winter.

Health related herd production problems and possible solutions. Emphasis given to diseases of the mammary gland, reproduction efficiency, nutrition, and general health management.

476. Advanced Ophthalmology (1). Lab. 4. 5 weeks. Pr., 4th yr. Max. 20.

This course deals with advanced ocular diagnostics and intraocular surgery.

477. International Veterinary Literature (2). Lab. 4. Pr., reading knowledge of one foreign language or consent of instructor. Max. 10. Fall, Winter, Summer.

Selected and guided reading, compiling and abstracting of international literature reflecting current trends and progress in veterinary medicine.

478. Large Animal Anesthesia (1) Lec. 1, Lab 2. 5 weeks. Max. 6. 4VM status.

Discussion and application of principles and techniques of general and local anesthesia used in large animal surgery.

479. Diagnostic Virology (1). Lab. 4. Pr., none. Min. of 4, Max. no limit. Fall.

Applied concepts of virology and immunology in the diagnosis and management of viral infections.

480. Laboratory Procedures in Clinical Veterinary Bacteriology (1). Lab. 4. Pr., none. No limit.

The theory and practice of clinical bacteriology, as it pertains to the small, minimally equipped laboratory in a progressive veterinary clinic.

- 481. General Organology of Domestic Animals (2). Lab 4. Pr., VM 326, 327, 328. No limit. Summer.**
A histological study of the organ systems: cardiovascular, lymphoid, respiratory, digestive, urinary, reproductive, endocrine, nervous, muscle, connective tissue (bone).
- 482. Swine Herd Health (1). Lec. 1, Lab. 3. 5 weeks. Limited to senior students who have already been through the Dairy Group. Fall, Winter.**
A combination of lecture and field demonstrations covering all aspects of a Herd Health Program. Topics include the main swine diseases, surgical procedures, management practices, nutritional problems, housing, and waste disposal.
- 484. Reconstructive Soft Tissue Surgery in the Dog and Cat (1). Lec. 1. Lab. 3. 5 weeks. Spring.**
Management of contaminated wounds and reconstructive techniques used to repair traumatic injuries to skin, muscles, tendons, blood vessels, and nerves.
- 485. Small Animal Surgical Anatomy (2). Lab. 4. Pr., VM 320, 321. Max. 60.**
Anatomy of commonly used surgical procedures in the small animals.
- 486. Clinical Anatomy of Equine Appendages (2). Lab. 4. Pr., VM 322. Max. 20.**
The course covers clinical anatomy related to nerve blocks, joint injections, radiology, and the stay apparatus in addition to certain anatomical aspects of certain lamenesses.
- 487. Clinical Anatomy of Livestock (2) Lab. 4. Pr., VM 322. Max. 20.**
The application of the anatomy of livestock in clinical practice procedures.
- 488. Veterinary Applications to Zoo and Wildlife Species (2). Lab. 4. Pr., VM 401, 403. Max. 15.**
The structure, function and pharmacology affecting selected zoo and wildlife species with consideration of management techniques and practices.
- 489. Cage and Aviary Birds (2). Lab. 4. Pr., VM 321. Max. 20.**
Avian structure, function, diseases, public health implications, and nutrition and the techniques utilized to manage and treat birds.
- 490. Advanced Veterinary Neurology (2). Lab. 4. Pr., VM 403. Max. 20.**
The structure, function, and diseases of the nervous system and their application in diagnosis, case management and neurosurgery.
- 491. Advanced Small Animal Medicine. Lec. (1), Lab. (2). Any quarter by arrangement. Pr., VM 424 and 425.**
In-depth studies of gastroenterology, nephrology and dermatology.
- 492-493-494. Elective Clinics I, II, III (1-4). Lab. 2-8. Pr., 4th yr. Summer, Fall, Winter.**
The course is designed to further train the student in the science and art of large and small animal clinical practice.
- 495. Elective Clinical Pathology (2). Lec. 2, Lab. 2. 5 weeks. Max. 20. Pr., VM 423.**
An in-depth evaluation and interpretation of clinical hematologic and biochemical alterations in domestic animals.
- 496. Special Problems in Physiology (2). Summer.**
- 497. Special Problems in Pharmacology (2). Spring.**

NOTE: Veterinary Business Methods (ACF 491) (3). Lec. 3, Lab. 1. Pr., 4th yr. Summer.

The course is intended to impart the various aspects of business methods and legal concerns in starting a veterinary practice. Emphasis is placed on accounting systems, record keeping procedures and taxation.

NOTE: The following course is FAA 498 for VM students.

- 498. Special Problems in Fisheries and Aquacultures (2). Lab. 4 Winter. Max. 32.**
Aids students in the identification and isolation of parasites, bacterial and viral diseases of fish. Epizootiology of fish diseases and their control is discussed. Diseases of cultured species is emphasized. Some structural and functional characteristics and management problems are discussed.

Anatomy and Histology (VAH)

- 570. Histological Techniques (2-5). Quarter by arrangement. Pr., consent of instructor.**

A detailed study of the techniques employed in the preparation of cytological and histological materials.

GRADUATE

- 621. Cardiovascular Anatomy (5). Lec. 2, Lab. 9. Pr., consent of instructor. Quarter by arrangement.**
A study of the structure of the cardiovascular system. Comparative developmental, and gerontologic phases are emphasized.
- 622. A Comparative Study of the Urogenital System in Animals (5). Lec. 2, Lab. 9. Pr., consent of instructor. Quarter by arrangement.**
Structure of the central and peripheral nervous systems.
- 623. Neuroanatomy (5). Lec. 2, Lab. 9. Pr., consent of instructor. Quarter by arrangement.**
Structure of the central and peripheral nervous systems.
- 624. Experimental Neuroanatomy (5). Lec. 2, Lab. 9. Pr., consent of the instructor. Quarter by arrangement.**
Use of the Horsley-Clark stereotaxic instrument and other experimental neuroanatomical procedures.
- 625. Anatomy of the Locomotor System (5). Lec. 2, Lab. 9. Pr., consent of instructor. Quarter by arrangement.**
Dissection and study of the structures of the locomotor system. The horse is utilized as the primary model.
- 626. Anatomy of the Special Senses (5). Lec. 2, Lab. 9. Pr., consent of instructor. Quarter by arrangement.**
Study of taste, smell, sight, and hearing. Macroscopic and microscopic specimens are utilized to correlate structure and function.
- 627. Advanced Histology of Domestic Animals (5). Lec. 2, Lab. 6. Pr., consent of instructor. Quarter by arrangement.**
A detailed study of the basic tissues. The light microscope and electron micrographs are utilized to interpret morphology.
- 628. Advanced Organology of Domestic Animals (5). Lec. 2, Lab. 6. Pr., consent of instructor. Quarter by arrangement.**
A detailed study of organs and organ systems, utilizing the light microscope and electron micrographs to interpret morphology.
- 696. Seminar (1) Quarter by arrangement. Required of all graduate students who major in Veterinary Anatomy and Histology.**
- 698. Research Problems (2 to 5). Quarter and credit by arrangement.**
- 699. Research and Thesis. Quarter and credit by arrangement.**

Large Animal Surgery and Medicine (VLA)

GRADUATE

- 651-2-3. Advanced Large Animal Surgery (5-5-5). Lec. 1, Lab. 8. Any quarter by arrangement.**
Research in surgery. Advanced techniques for surgical procedures in the domestic animals.
- 654-655. Advanced Large Animal Medicine* (5-5). Lec. 1, Lab. 8. Any quarter by arrangement.**
Special study of the causes, methods of diagnosis, treatment and methods of control and education of selected non-surgical diseases of domestic animals.
- 657. Gynecology of Large Domestic Animals (5). Any quarter by appointment.**
Special study of functional and infectious conditions affecting female reproduction.
- 658. Andrology of Large Domestic Animals (5). Any quarter by arrangement.**
Special study of functional and infectious conditions affecting breeding sires.
- 696. Seminar (1). Required of all graduate students in Large Animal Surgery and Medicine. Meets at scheduled intervals each year.**
- 698. Research Problems (2-5). Credit to be arranged.**
- 699. Research and Thesis. Credit to be arranged.**

Microbiology (VMI)**GRADUATE**

- 501. Veterinary Microbiology II (6). Lec. 3, Lab. 6. Departmental approval. Fall.**
Bacteriology and Mycology of Veterinary Pathogens. Same as VM 460.
- 502. Veterinary Microbiology III (5). Lec. 3, Lab. 4. Departmental approval. Winter.**
Animal viruses, pathogenesis of viral diseases, and host responses to viral infections. Chlamydia and rickettsia are considered briefly. Same as VM 461.
- 503. Veterinary Public Health (4). Lec. 3, Lab. 2. Departmental approval. Spring.**
Principles of epidemiology, selected diseases of animals transmissible to men and the relationship of the veterinarian to public health and animal disease control agencies. Same as VM 413.
- 536. Diagnostic Virology (1). Lab. 4. Departmental approval. Fall.**
Applied concepts of virology and immunology in the diagnosis and management of viral infections.
- 537. Laboratory Procedures in Clinical Veterinary Bacteriology (1). Lab. 4. Departmental approval. Winter.**
The theory and practice of clinical bacteriology as it pertains to the small minimally equipped laboratory in a progressive veterinary clinic.
- 601. Determinative Veterinary Bacteriology (5). Lec. 3, Lab. 4. Departmental approval. Winter and Spring.**
Identification, classification, nomenclature, distribution and systematic relationship of bacteria of veterinary significance. The historical background, literature of bacterial taxonomy and rules of nomenclature will be considered.
- 602. Bacterial Pathogenesis (5). Lec. 5. Departmental approval. Fall and Winter.**
How bacteria cause disease. The cellular and subcellular basis for bacterial pathogenesis. Study of bacterial toxins, host-bacteria interaction, mixed bacterial and bacterial-viral infections.
- 604. Immunobiology (5). Lec. 5. Departmental approval. Fall and Winter.**
The biologic basis of the immune response. Immunocompetent cells. Various types of immune responses. Hypersensitivities, blood and tissue antigens, histocompatibility and immunogenetics.
- 605. Immunology of Infectious Diseases (5). Lec. 5. Departmental approval. Summer and Fall.**
The immune mechanism to selected models of human and animal infectious diseases.
- 606. Bovine Virology (5). Lec. 3, Lab. 4. Departmental approval.**
Bovine viruses and the diseases they produce. Laboratory work includes techniques of studying bovine viruses and evaluating the resistance of the bovine to viral diseases.
- 607. Pathogenesis of Virus Diseases of Animals (5). Lec. 5. Departmental approval. Spring.**
How animal viruses produce disease in their hosts. Various well-studied models are used to demonstrate current theories and knowledge of pathogenetic mechanisms of virus-induced neurological diseases, enteric diseases, respiratory diseases, immune complex diseases, and neoplastic diseases.
- 608. Advanced Epidemiology (5). Lec. 2, Lab. 6. Departmental approval. Quarter by arrangement.**
Advanced techniques in epidemiological investigation; their application to diseases of man and animals for control purpose.
- 609. Medical Mycology (5). Lec. 3, Lab. 4. Departmental approval and acceptable courses in bacteriology. Quarter by arrangement.**
Methods and techniques used in isolating and propagating yeasts, molds, and actinomycetes pathogenic for animals. Laboratory diagnosis of fungus infections in animals.
- 696. Seminar (1). Quarter by arrangement. Required of all graduate students who major in Veterinary Microbiology.**
- 698. Research Problems (2-5). Quarter and credit by arrangement.**
- 699. Research and Thesis. Quarter and credit by arrangement.**

Pathology and Parasitology (VPP)**ADVANCED UNDERGRADUATE AND GRADUATE**

- 518. General Pathology (5). Lec. 3, Lab. 4. Pr., Satisfactory courses in histology and physiology. Fall quarter.**
The fundamental alterations of disease, adapted for especially qualified graduate students. (Not available for candidates for M.S. in Vet. Med.)

- 567. Gross Pathology* (2).** Lab. 6. Pr., VM 407, and consent of instructor. Any quarter by arrangement.
Consists of regular participation in the necropsy examinations under the supervision of senior staff members. Designed to give the graduate student experience in necropsy procedures and in diagnostic interpretation of gross lesions.
- 575. Special Techniques in Histopathology* (3).** Lab. 9. Pr., VM 407, VAH 570. Any quarter by arrangement.
Special stains and techniques of histochemistry employed in the preparation of materials for histopathologic study.

GRADUATE

- 609. Pathology of Nutritional and Metabolic Diseases (3).** Lec. 2, Lab. 2. Pr. D.V.M. degree or VM 418 or equivalent and consent of instructor.
The pathogenesis, physiopathology, and morphologic pathology of nutritional and metabolic diseases of domestic and laboratory animals.
- 610. Clinical Oncology* (5).** Lec. 5.
Concepts useful in the diagnosis and treatment of neoplastic diseases.
- 611-612. Advanced Pathology* (5-5).** Lec. 2, Lab. 6. Pr., VM 407 or equivalent. Any quarter by arrangement.
A comprehensive study of gross and microscopic lesions of animal diseases.
- 613. Advanced Clinical Pathology I* (5).** Lec. 2, Lab. 4. Pr., VM 423 or equivalent. Spring quarter.
A comprehensive evaluation of diseases altering the lymphohematopoietic system.
- 614. Advanced Clinical Pathology II* (5).** Lec. 2, Lab. 3. Pr., VM 423 or equivalent. Fall.
A study of the concepts relating modern laboratory investigations to disease pattern recognition.
- 615. Oncology* (5).** Lec. 1, Lab. 8. Pr., VPP 575. Any quarter by arrangement.
Gross and microscopic pathology of neoplasms of domestic animals.
- 616. Histochemistry (5).** Lec. 2, Lab. 6. Pr., CH 419, VPP 518, VM 460 or ZY 308 or equivalent. Permission of instructor. Any quarter by arrangement.
Evaluation and application of histochemical methods in the localization of cellular constituents.
- 617. Veterinary Protozoology (5).** Lec. 3, Lab. 4. Pr., VM 410 or ZY 411 or equivalent. Any quarter by arrangement.
Detailed study of selected diseases of veterinary importance caused by protozoan parasites.
- 618-619. Veterinary Helminthology (5-5).** Lec. 3, Lab. 4. Pr., VM 410 or ZY 411 or equivalent. Any quarter by arrangement.
Detailed study of selected diseases of veterinary importance caused by metazoan parasites.
- 620. Pathology of Parasitic Diseases (5).** Lec. 2, Lab. 6. Pr., VM 410 or equivalent. Any quarter by arrangement.
A detailed study of the pathology of parasitic diseases of veterinary importance.
- 696. Seminar (1).** Required of all graduate students with a major in veterinary Pathology and Parasitology. Any quarter by arrangement.
- 698. Research Problems (2 to 5).** Credit to be arranged.
- 699. Research and Thesis.** Credit to be arranged.

Physiology and Pharmacology (VPH)

GRADUATE

- 601. Medical Physiology I (5).** Lec. 4, Lab. 2. Pr., an acceptable course in physiology. All quarters.
Functional analysis of mammalian organ systems with special emphasis on myology, neurology, circulation and respiration. Laboratory exercises will make use of the physiograph to validate physiologic functions.
- 602. Medical Physiology II (5).** Lec. 4, Lab. 2. Pr., An acceptable course in physiology. All Quarters.
A continuation of VPH 601 with special emphasis on digestive, excretory, endocrine and reproductive systems.
- 605. Respiratory Physiology (5).** Pr., PH 601. Summer.
A detailed study of respiratory physiology and the physiological aspects of aviation, space and deep sea diving.

*Available only to students who hold the D.V.M.

631. **Advanced Renal and Hepatic Physiology (5).** Lec. 4, Lab. 3. Pr., VPH 602. Summer.
The physiology of the liver and kidney and the effects that certain disease processes have on these organs.
632. **Advanced Endocrinology and Reproduction (5).** Lec. 4, Lab. 3. Pr., VPH 602. Fall.
A study of the endocrine and reproductive systems of domestic animals in both health and disease.
633. **Advanced Neurology (5).** Lec. 4, Lab. 3. Pr., VPH 601. Winter.
A detailed study of the physiology of the mammalian nervous system. Considerable emphasis will be placed on the physiological explanation of abnormalities and the use of the electroencephalogram.
- 635-636. **Advanced Veterinary Pharmacology (5-5).** Lec. 3, Lab. 4. Pr., VM 402. Any quarter by arrangement.
A detailed study of the pharmacology of some of the more important drugs used in veterinary medicine. In the laboratory, the students will have an opportunity to determine the pharmacology of the drugs on the horse, cow, pig, and dog.
638. **Physiology of Digestion (5).** Lec. 5. Pr., VPH 602. Spring.
A detailed study of enzymatic and bacterial digestion as well as the motility of the gastrointestinal tract in farm animals.
639. **Small Animal Nutrition (5).** Lec. 4, Lab. 3. Any quarter by arrangement. Pr., Permission of the instructor and acceptable courses in physiology.
Requirement of amino acids, fats, carbohydrates, minerals and vitamins for dogs, cats and other small animals. Nutritional antagonists and symptoms of nutritional deficiencies in the animals.
643. **Veterinary Radiation Biology (5).** Lec. 4, Lab. 3. Any quarter by arrangement. Pr., consent of the instructor and acceptable courses in chemistry and animal Physiology.
A study of the instruments used for radiation detection, isotope techniques, and diagnostic tests used in animals, and the effects of radiation on animal tissues. The isotopes will be primarily gamma emitters.
645. **Electrocardiology and Blood Vascular Physiology (5).** Pr., VPH 601. Fall.
A study of the physiology of the blood vascular system and the advanced techniques used in electrocardiology.
696. **Seminar (1).** Required of all graduate students in this department.
698. **Research Problems (2 to 5).** Credit to be arranged.
699. **Research and Thesis.** Credit to be arranged.
799. **Doctoral Research and Dissertation.**

Small Animal Surgery and Medicine (VSA)

ADVANCED UNDERGRADUATE AND GRADUATE

Candidates for a master's degree in the School of Veterinary Medicine may be required to pass a preliminary oral or written examination to demonstrate adequate knowledge in their chosen fields. They must meet the general requirements for admission into the Graduate School.

580. **Radiological Techniques (5).** Lec. 3, Lab. 4. Any quarter by arrangement.
A detailed study of radiographic techniques including assignments on basic radiation physics.
647. **Canine Neurosurgery* (5).** Lec. 2, Lab. 6. Pr., consent of the instructor. Any quarter by arrangement.
The study of the applied anatomy, physiology, physical and radiographic diagnosis, and surgical correction of lesions (especially those of traumatic origin) affecting the nervous system of the dog.
660. **Advanced Small Animal Surgery* (5).** Lec. 1, Lab. 10. Any quarter by arrangement.
Techniques in general small animal surgery.
662. **Advanced Small Animal Orthopedic Surgery* (5).** Lec. 1, Lab. 10. Any quarter by arrangement.
New techniques in general orthopedic surgery.
663. **Advanced Veterinary Ophthalmology I. General Ophthalmology (5).** Lec. 3, Lab 4. Pr., Any quarter by arrangement.
An advanced study of general techniques of diagnosis, medication and surgical techniques necessary for veterinary ophthalmology.

*Available only to students who hold the D.V.M.

- 664-665. Advanced Small Animal Medicine* (5-5). Lec. 1, Lab. 10. Any quarter by arrangement.**
Special study of the causes, methods of diagnosis, treatment and control of non-surgical diseases of small animals.
- 666. Advanced Canine Neurology* (5). Lec. 3, Lab. 6. Any quarter by arrangement.**
Advanced study of the neurodiagnostics and non-surgical therapy of neurological disorder in small domestic animals.
- 667. Normal Radiological Anatomy (5). Lec. 4, Lab. 2. Any quarter by arrangement.**
A detailed study of the normal structure, size and position of the various organs as they appear on flat and contrast radiographs.
- 668. Advanced Radiology* (5). Lec. 1, Lab. 8. Any quarter by arrangement.**
A detailed study of advanced radiographic techniques including fluoroscopy, uses of contrast mediums and the principles of image intensification and cineradiography.
- 669. Radiological Interpretations* (5). Lec. 1, Lab. 8. Any quarter by arrangement.**
Advanced study of radiological interpretation of pathological lesions of domestic animals.
- 671. Small Animal Cardiovascular Surgery (5). Lec. 1, Lab. 10. Any quarter by arrangement.**
Application of accepted, as well as the recently developed techniques of cardiovascular surgery.
- 672. Advanced Veterinary Ophthalmology II. Instrumentation (5). Lec. 2, Lab. 6. Prerequisites: Any quarter by arrangement.**
Emphasis is placed on the use of advanced instrumentation necessary for the diagnosis and treatment of ocular disease.
- 673. Advanced Veterinary Ophthalmology III. Advanced Ophthalmic Medicine (5). Lec. 3, Lab. 4. Prerequisites: VSA 672. Any quarter by arrangement.**
An advanced study in ophthalmology with emphasis on diagnosis and treatment of ocular diseases.
- 674. Advanced Veterinary Ophthalmology IV. Advanced Ophthalmic Surgical Technique. (5). Lec. 2, Lab. 6. Prerequisite: VSA 673. Quarter by arrangement.**
An advanced study in ophthalmology with emphasis on ophthalmic surgery.
- 696. Seminar (1). Required of all graduate students in Veterinary Medicine.**
Meets regularly at scheduled intervals each year during Summer Quarter.
- 698. Research Problems (2 to 5). Credit to be arranged.**
- 699. Research and Thesis. Credit to be arranged.**

Zoology-Entomology (ZY)

Professors Hays, Head, Bass, Berger, Blake, Dendy, Dusi, and Mount
Adjunct Professor Jones

Associate Professors Alexander, Causey, Cunningham, Dixon, Dobie, Folkerts, Gilliland, Harper, Hyche, Ivey, Kouskolekas, Mason, Pamatmat, Ramsey, Speake, and Watson
Adjunct Associate Professor Frandsen

Assistant Professors Ball, Estes, Hill, Kennamer, Lawrence, Lisano,
Mullen, Pritchett, Pullen, Slack, Williams, and Young
Instructor Brugh

- 100. Zoological Orientation (0). Lec. 1. Fall.**
Historical and current concepts embodied in various disciplines of the zoological sciences.
- 105. Introductory Human Physiology (5). Lec. 4, Lab 2. All Quarters.**
The organ systems of the human body and their functions. For non-science majors only. Degree credit may not be earned in both ZY 105 and BI 103. This course is designed primarily for Home Economics students.
- 204. Insects (3). Lec. 3. General Elective. Winter, Spring.**
Life processes, occurrence, and importance of insects. Degree credit may not be earned in both ZY 204 and ZY 304 or ZY 502.
- 205. Wildlife Conservation (3). Lec. 3. General Elective. Fall, Spring.**
Conservation and natural history of important wildlife animals, especially Alabama species. Degree credit may not be earned in both ZY 205 and ZY 328.
- 206. Conservation in the United States (3). General elective. Winter, Summer.**
Basic facts essential to an understanding of current problems pertaining to the conservation of our rapidly depleting natural resources such as soil, water, minerals, forest, and wildlife. Especially planned for elementary and high school teachers.
- 207. Birds (3). Lec. 3. General Elective. Fall, Summer.**
Birds in relation to agriculture and game management, recognition of various species, flight, songs, color markings, and feeding habits. Degree credit may not be earned in both ZY 207 and ZY 522.

*Available only to students who hold the D.V.M.

- 208. Biological Issues in Human Ecology (3). Lec. 3. All quarters.**
An investigation into the origin, nature, and growth of human populations, emphasizing the role of man in past, present, and future ecosystems. Degree credit may not be earned in both ZY 208 and BI 104.
- 209. Bee Culture (3). Lec. 2, Lab 3. General Elective. Spring, Summer.**
Manipulation and production of bees and honey, and a consideration of bee diseases.
- 210. Introduction to Oceanography (3). Lec. 3. General Elective. Winter.**
A perspective of the earth as a single ecological system, the interrelationship between the continents and the oceans, major features of the physics, chemistry, geology, and biology of the oceans and their importance to man. Degree credit may not be earned in both ZY 210 and ZY 435.
- 250. Human Anatomy (5). Lec. 3, Lab. 6. Pr., BI 101. All quarters.**
A study of the structure of the human body combined with a comprehensive study and dissection of a large mammal. Structural similarities and dissimilarities will be emphasized in the laboratory.
- 251. Physiology (5). Lec. 4, Lab. 3. Pr., BI 103 or ZY 250. All quarters.**
Function of mammalian systems with emphasis on man. Laboratory exercises will provide students with an opportunity to validate functions on laboratory animals.
- 300. Genetics (5). Lec. 4, Lab. 2. Pr., BI 102 or 103 and college algebra or equivalent. All quarters.**
Basic genetic principles, theoretical basis for genetic systems, and modern areas of research. Laboratory work emphasizes experiments with the fly, *Drosophila*.
- 301. Comparative Anatomy (5). Lec. 3, Lab. 6. Pr., BI 103. All quarters.**
Comparisons of the systems of the vertebrates.
- 302. Vertebrate Embryology (5). Lec. 3, Lab. 6. Pr., BI 103. Fall, Winter, Spring.**
Consideration of the details of fertilization, cleavage, morphogenesis, and organogenesis of the frog, chick, pig, and human from a descriptive and analytical viewpoint. Laboratory work will consist of prepared material supplemented with available living material.
- 303. Principles of Evolution and Systematics (5). Lec. 5. Pr., BI 102 or 103. Fall, Winter, Spring.**
The major processes, methods, and philosophic basis for present day concepts of evolution and systematics.
- 304. General Entomology (5). Lec. 4, Lab. 3. Pr., BI 103. Fall, Spring, Summer.**
General characteristics and habits of the orders and families of the Class Insects.
- 305. Forest Entomology (3). Lec. 2, Lab. 3. Pr., BI 103. Spring.**
Principles of entomology in relation to insects of forests and forest products; recognition, life histories, and control of major insects of forests.
- 306. General Animal Ecology (5). Lec. 4, Lab. 3. Pr., 10 hours of biology or consent of instructor. Fall, Spring.**
The physical and biotic environments and the interactions of these factors with animals. The organization and functions of communities and populations.
- 308. Micrology (5). Lec. Lab 9. Pr., BI 103 and CH 207-208 or consent of instructor. Fall, Winter, Spring.**
Laboratory methods of fixation, embedding, sectioning, staining, and mounting of animal tissues; and an introduction to techniques of light microscopy.
- 310. Cell Biology (5). Lec. 4, Lab. 3. Pr., 10 hours of General Biology. All quarters.**
Morphology and physiology of cell membranes, cytoplasm, and the formed elements of the cytoplasm and nucleus. Cell division, molecular transport, cellular homeostasis, and biochemical pathways of energy production.
- 328. Principles of Game Management (5). Lec. 4, Lab. 3. Pr., a course in ecology. Fall, Spring.**
Fundamentals of game management theory, application, and administration.
- 416. Studies and Techniques in Field Biology and Ecology (10). Pr., major or minor in a biological field, consent of instructor; junior standing. Summer, odd years.**
A field trip during the summer quarter to an area or areas away from the southeastern United States. Practical experience in the collection and preservation of specimens. Studies of basic ecological phenomena in a field situation. Stops at institutions to visit outstanding biologists and see field biology research in action. May not be taken concurrently with other courses. A fee, varying with the nature and extent of the trip, will be charged.
- 425. Forest Wildlife Management (3). Lec. 3. Pr., FY 520 or consent of instructor. Winter.**
Principles of wildlife management as applied to forest properties. Restricted to students in forestry.
- 433. Fish and Wildlife Law Enforcement (3). Lec. 3. Spring, odd Years. Pr., junior standing.**
Basic principles and techniques of fish and wildlife laws and law enforcement. Restricted to students in Fisheries or Wildlife Management.
- 435. General Oceanography (3). Lec. 3. Winter. Pr., acceptable physics, chemistry, and mathematics background.**
Physical, chemical, and geological characteristics of the oceans, especially as they relate to present understanding of marine ecology and the biological productivity of marine waters.

- 436. Marine Biology (3). Lec. 3. Pr., invertebrate zoology, general physiology. Spring.**
Marine organisms, their physiological adaptations to the environment, with emphasis on respiration, nutrition and feeding, osmoregulation, reproduction, and biological associations in the context of ecology.
- 439. Aquatic Communities (5). Lec. 2, Lab. 9. Pr., BI 102-3, junior standing. Summer.**
Environmental relations of the biota of freshwater habitats.
- 498. Special Problems (1-3). Pr., senior standing.**
A. Zoology; B. Entomology; C. Wildlife Management. A student can register for a total of not more than three hours credit.

ADVANCED UNDERGRADUATE AND GRADUATE

- 501. Invertebrate Zoology (5). Lec. 3, Lab. 6. Pr., BI 103. Fall, Winter, Summer.**
Biology, taxonomy, and ecology of invertebrate animals.
- 502. Economic Entomology (5). Lec. 4, Lab. 3. Fall, Spring, Summer.**
Consideration of the biological aspects, life histories, and control of insects.
- 504. Medical Entomology (5). Lec. 4, Lab. 3. Pr., ZY 304. Spring, even years.**
Insects, mites, and ticks of parasitological or medical importance to man. Emphasis placed on the role of arthropods in transmission of protozoan and other diseases and prevention of these diseases by controlling their arthropod vectors.
- 505. Forest Insects (5). Lec. 4, Lab. 3. Pr., ZY 304, 305, or 502. Fall even years.**
Principal insects of forests and forest products; their importance, taxonomy, bionomics, and control. Emphasis will be placed on life histories and habits, identification by morphological characteristics and type of damage, and control by chemical, biological, and cultural or forest-management practices.
- 507. General Insect Morphology (5). Lec. 3, Lab. 6. Pr., ZY 304. Winter.**
Comparative external anatomy and generalized internal structures of insects; characteristics used in taxonomy will be emphasized.
- 509. Histology (5). Lec. 3, Lab. 6. Pr., BI 103. All quarters.**
Morphology, histogenesis, regeneration and repair, and classification of tissues; arrangement of tissues in organs and systems of vertebrate animals.
- 510. Systematic Entomology (5). Lec. 2, Lab. 6. Pr., ZY 304. Spring**
Principles of systematics and identification of insects through orders, families, genera, and species.
- 511. General Parasitology (5). Lec. 3, Lab. 6. Pr., BI 103. All quarters.**
Origin, adaptations, physiology, and ecology of parasites. Identification and life histories of representative parasitic protozoa, helminths, and arthropods with emphasis on host-parasite relationships. Techniques of examining animals for the presence of parasites and the proper preparation of such collections for study.
- 515. Limnology (5). Lec. 3, Lab. 6. Pr., CH 104, PS 205, BI 103. Spring.**
Biological, chemical, and physical factors affecting aquatic life.
- 517. Quantitative Genetics (5). Lec. 4, Lab. 3. Pr., ZY 300, BY 517 or by consultation with instructor. Spring.**
The description and inheritance mode of traits exhibiting continuous variation; analytical procedures and methodology of computer use in genetics.
- 518. Non-Mendelian Genetics (3). Pr., ZY 300. Fall.**
Current status of behavioral, cytogenetic, cytoplasmic, developmental, and recombinational genetics will be considered.
- 519. Molecular Genetics (3). Pr., ZY 300. Winter.**
Current status of molecular genetics; nucleic acids, regulation, mutagenesis, and immunology will be considered.
- 520. Human Genetics (5). Lec. 5. Pr., ZY 300, CH 208. Spring.**
Effects of normal and abnormal chromosome complements, the biological interaction of genes, and the effects of mutation and changes in gene frequency on human populations; problems in small sample analysis, biochemical screening of human "carriers," and the prospects for genetic engineering.
- 521. Vertebrate Zoology I (5). Lec. 3, Lab. 6. Pr., BI 103. Fall, Spring, Summer.**
Taxonomy, ecology, and evolution of fishes, amphibians, and reptiles.
- 522. Vertebrate Zoology II (5). Lec. 3, Lab. 6. Pr., BI 103. Fall, Spring, Summer.**
Basic taxonomy, ecology, evolution, and some biological principles of birds and mammals. Laboratory studies in radio-telemetry, bioacoustics, and population dynamics are used in addition to classical vertebrate zoology exercises.
- 524. Animal Physiology (5). Lec. 4, Lab. 3. Pr., Biochemistry or ZY 310, CH 208. All quarters.**
Systematic study of the physiology of the nervous system, special senses, circulation, respiration, digestion, kidney function, hormonal control, and reproduction. An effort is made to acquaint the student with methods of experimentation as a means for the direct acquisition of physiological facts.
- 528. Wildlife Biology (5). Lec. 3, Lab. 6. Pr., ZY 328. Fall, Winter.**
Basic principles of the ecology of wildlife populations and their relations to natural habitat. Laboratory work will consist of practical exercises designed to acquaint the student with modern methodology and technique in studying wild bird and mammal populations.

- 531. Wildlife Habitat Analysis (3). Lec. 1, Lab. 6. Pr., ZY 528, BY 506. Spring, odd years, Summer.**
Practical exercises in vegetation analysis, utilization studies, aerial photograph interpretation, and cover type mapping.
- 536. Biological Oceanography (5). Lec. 5. Pr., ZY 435 or consent of instructor. Spring.**
Oceanic ecosystems, biological productivity of the oceans, energy transfer in oceanic food chains, and an introduction to biological oceanographic investigation.
- 538. General Ichthyology (5). Lec. 3, Lab. 6. Pr., BI 103. Fall.**
Morphological, functional, geographical, and behavioral survey of fishes. Classification of fishes using monographs and keys. Field trips and laboratory work will emphasize local species.
- 542. Marine Fisheries Management (6). Lec. 3, Lab 9. Pr., 18 hrs. of biology including BI 103. Summer.**
A general course in fisheries management designed to acquaint students with the philosophy, objectives, problems, and principles involved in management decisions. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
- 543. Marine Vertebrate Zoology and Ichthyology (9). Lec. 5, Lab. 12. Pr., 18 hours of biology including BI 103. Summer only.**
The marine chordata, including lower groups and the mammals and birds, with most emphasis on the fishes. Offered only at the Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
- 545. Marine Invertebrate Zoology (9). Lec. 5, Lab 12. Pr., 18 hrs. biology including BI 103 and ZY 501. Summer.**
The marine invertebrates, especially those of the Mississippi Sound region. Emphasis is placed on the structure, classification, phylogenetic relationships, and functional processes. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
- 548. Marine Ecology (7½). Lec. 3, Lab 6. Pr., BI 102, ZY 501, and acceptable chemistry. Summer.**
A consideration of the relationship of marine organisms to their environment, and the effects of the environment on the abundance and distribution of marine organisms. Offered only at the Gulf Coast Laboratory, Ocean Springs, Mississippi.
- 550. Zoogeography of the Vertebrates (5). Lec. 4, Lab. 3. Pr., ZY 521, or consent of instructor. Winter, even years.**
The principles of geographic distribution of vertebrate animals.
- 560. Mammalian Physiology I (5). Lec. 4, Lab 3. Pr., CH 208, ZY 250 or equivalent, and ZY 310 or Biochemistry. Fall, Spring.**
A treatment of cellular bioelectric phenomena, muscle contractility, neurophysiology, and cardiovascular physiology. Laboratory will utilize modern methodology for the observation of physiological fact.
- 561. Mammalian Physiology II (5). Lec. 4, Lab 3. Pr., ZY 560 or equivalent. Winter, Summer.**
A continuation of ZY 560 with emphasis upon respiratory, renal, digestive, metabolic, and endocrine physiology.

GRADUATE

- 601. Advanced Insect Morphology (5). Lec. 3, Lab. 6. Pr., ZY 507. Fall.**
A detailed study of the structure of insects and a consideration of embryological development.
- 602. Advanced Insect Taxonomy (5). Lec. 1, Lab. 8. Pr., ZY 510. Summer, odd years.**
Principles of systematics including phylogeny with emphasis on a particular group of insects which the student may choose.
- 603. Insect Physiology (5). Lec. 3, Lab. 6. Pr., ZY 524 and ZY 601. Spring, even years.**
General and comparative physiology of the organ systems of insects. A minimum of two literature reviews will be made by each student during the quarter.
- 604. Insect Toxicology (5). Lec. 4, Lab. 3. Winter.**
Toxic action of insecticides: analysis, preparation and use of insecticides; spray residues in relation to health; research methods in insect toxicology.
- 605. Ornithology (5). Lec. 3, Lab. 6. Pr., ZY 522. Spring.**
Ecology and behavior of birds.
- 606. Mammalogy (5). Lec. 3, Lab. 6. Pr., ZY 522. Winter.**
Taxonomy, ecology, and behavior of mammals.
- 607. Farm Game Management (5). Lec. 3, Lab. 6. Pr., ZY 528. Winter, odd years.**
For graduate students majoring in Game Management or Fisheries Management. Application of game management theories, techniques, and administration with special emphasis on farm game species.
- 608. Forest and Range Game Management (5). Lec. 3, Lab. 6. Pr., ZY 528. Spring, even years.**
For graduate students majoring in Game Management or Fisheries Management. Application of game management theories, techniques, and administration with special reference to forest and range game.

- 609. Advanced Applied Entomology (5). Lec. 4, Lab. 3. Pr., ZY 502. Fall.**
Integrated control of the principal insects by environmental, biological, genetic, chemical, and legal means.
- 610. Immature Forms of Insects (5). Lec. 2, Lab. 6. Pr., ZY 510. Winter.**
Structure and identification of immature forms of insects: methods of collecting and preserving; development and use of keys for classifying immature insects.
- 612. Advanced Insect Toxicology (5). Lec. 4, Lab. 3. Pr., ZY 604. Spring, odd years.**
Mode of action, mode of entry, relation of chemical structure to toxicity, and precision methods of determination of insecticides; recent developments in the field of insecticide chemistry.
- 613. Insect Pathology (5). Lec. 3, Lab. 4. Pr., BY 300, ZY 502 and consent of instructor. Spring, even years.**
The microorganisms associated with diseases in insects and their pathological effects on insects and insect populations.
- 614. Biological Control of Insects (5). Lec. 4, Lab. 3. Pr. ZY 502. Spring, odd years.**
Biology, ecology, classification, and behavior of predators, parasites, and disease agents influencing insect populations. Utilization of biotic agents for management of pest populations.
- 616. Ichthyology (3). Lec. 3. Pr., ZY 538 or consent of instructor. Winter.**
Fishes of the world, emphasizing morphology, distribution, and life history. Review of world literature on fish systematics.
- 618. Advanced Invertebrate Zoology (5). Lec. 3, Lab 6. Pr., ZY 501 or consent of instructor. Spring, Odd Years.**
A comparative study of the biology of minor invertebrate phyla with special emphasis on morphology and taxonomy.
- 619. Comparative Invertebrate Physiology (5). Lec. 4, Lab. 3. Pr., ZY 501 and consent of instructor. Spring, even years.**
The physiological mechanisms of invertebrates with special emphasis on respiration, excretion, reproduction, locomotion, nutrition, circulation, and behavior.
- 622. History and Literature of Zoology (4). Lec. 3, Lab. 3. Pr., graduate standing. Fall.**
A historical review of the classical authors and great works in zoological literature. Laboratory will concentrate on examining and learning to use journals, abstracts, and reference materials in the library.
- 623. Organic Evolution (5). Pr., ZY 300. Fall.**
Evolutionary principles as illustrated by the various biological disciplines, particularly genetics, paleontology, zoogeography, and systematics in general.
- 627. Immunology and Physiology of Parasites (5). Lec. 3, Lab. 6. Pr., ZY 511, BY 300, ZY 524, and consent of instructor. Winter, even years.**
Immunity mechanisms to infections of protozoan and helminth parasites. Chemical physiology of host-parasite relationship to include nutrition, metabolism, toxicity, and chemotherapy.
- 629. Advanced Quantitative Genetics (5). Lec. 4, Lab. 2. Pr., ZY 517. Fall, odd years.**
Advanced concepts of analyzing quantitative genetic characters in plant and animal species.
- 630. Advanced Genetics (5). Pr., ZY 300 and ZY 518. Winter, odd years.**
Non-Mendelian hereditary systems, regulation of gene action as it influences growth, differentiation, and development; and the status of contemporary genetics research.
- 631. Biochemical Genetics (3). Prs., ZY 300, ZY 519, corequisite, ADS 519. Spring, even years.**
Advanced studies of gene action on the biochemical level pertaining to metabolism, differentiation, immuno-genetics, and mutagenesis. Emphasis on research in prokaryotic and eukaryotic systems.
- 632. Helminthology (5). Lec. 3, Lab. 6. Pr., ZY 511. Spring.**
Advanced morphology, physiology, life cycles, and host-parasite relationships of helminths. Opportunity for making extensive literature studies and collections of the parasites of a particular group of animals in which the student is most interested.
- 634. Protozoology (5). Lec. 3, Lab. 6. Pr., ZY 511. Winter, odd years.**
Free-living and parasitic protozoa important to agriculture, wildlife, and man. Morphology, physiology, reproduction, ecology, and life histories of parasitic forms will be emphasized.
- 635. Furbearer and Waterfowl Management (5). Lec. 3, Lab. 6. Pr., ZY 528. Winter, even years.**
For graduate students with a major or minor in wildlife management. A study of furbearer and waterfowl resources. Emphasis is placed on problems of management and utilization.
- 336. Ecology of Animal Populations (3). Pr., ZY 306. Winter.**
An investigation of the balance of nature, population cycles, natural regulation of animal numbers, competition, epizootics, and the compensatory adjustments of populations to changes in the environment.
- 637. Herpetology (5). Lec. 1, Lab. 8. Pr., ZY 521. Spring.**
The morphology, taxonomy, ecology, and behavior of amphibians and reptiles. Laboratory collecting, preserving, and identification of local specimens will be an important consideration.

640. **Nematology (3). Lec. 2, Lab. 3. Pr., ZY 501 or 511. Spring.**
Identification of the free-living soil- and aquatic nematodes and of the insect-parasitic nematodes. Detailed consideration of aspects of nematode morphology, reproduction, development, behavior, physiology, and ecology.
644. **Physiology of the Cell (3). Pr., ZY 310 and ZY 524. Fall.**
Examination of the basic physiological processes at the cellular level with the tools and approaches of physical science.
645. **Neurobiology (5). Lec. 3, Lab. 6. Pr., ZY 524. Winter.**
Morphology, physiology, and evolution of the central, autonomic, and neurohormonal systems of the vertebrate.
646. **Renal and Digestive Physiology (5). Lec. 4, Lab. 3. Pr., ZY 524. Fall.**
A comprehensive study of renal and digestive mechanisms for the qualified student in animal physiology.
647. **Endocrinology (5). Pr., ZY 524 and AH 519. Spring.**
A comprehensive treatment of the classical and modern literature of endocrinology for the qualified student in animal biology.
648. **Experimental Endocrinology (5). Pr., ZY 647 or taken concurrently. Spring.**
Laboratory studies of endocrine control mechanisms utilizing surgical, bioassay, biochemical assay, histochemical, and autoradiographic methods and techniques.
650. **Biological Effects of Radiation (5). Lec. 3, Lab 6. Pr., ZY 310 or ZY 524 or equivalent, PS 205 and PS 206 or equivalent, or consent of instructor. Summer.**
An introduction to radiation biology including radiation physics; radiation detection equipment; dosimetry; the effects of ionizing radiation at molecular, cellular, organ, and organismic levels, and radioprotection.
693. **Seminar. (Credit to be arranged.)**
697. **Problems in Marine Zoology (4-9). Pr., ZY 542 or 548. All year.**
Supervised research on specific problems in marine zoology for graduates. Offered only at The Gulf Coast Research Laboratory, Ocean Springs, Mississippi.
698. **Special Problems (2-5). All quarters.**
A. Zoology; B. Entomology; C. Apiculture; D. Parasitology; E. Physiology; F. Wildlife
699. **Research and Thesis. (Credit to be arranged.)**
799. **Doctoral Research and Dissertation. (Credit to be arranged.)**



Faculty and Staff

1976-77

(The parenthetical designation after a faculty member's title indicates his department, except in the School of Pharmacy which contains no formal departments. The first date after the title indicates the year of first appointment to any position in the institution; the second, the year of appointment to present rank.)

GENERAL ADMINISTRATIVE OFFICERS

- PHILPOTT, HARRY M. *President*, 1965
A.B., Washington and Lee University; Ph.D., Yale University; D.D. (Hon.), Stetson University; LL.D. (Hon.), Washington and Lee University; LL.D. (Hon.), University of Florida; LL.D. (Hon.), University of Alabama.
- LANHAM, BEN T., JR. *Vice President for Administration*, 1939, 1972
B.S., Clemson University; M.S., University of Tennessee; Ph.D., Michigan State University.
- LITTLETON, TAYLOR D. *Vice President for Academic Affairs and Professor (English)*, 1957, 1972
B.S., M.A., Ph.D., Florida State University.
- CARROLL, CHESTER C. *Vice President for Research*, 1965, 1972
B.S.E.E., M.S.E.E., Ph.D., University of Alabama.
- BRAMLETT, GENE A. *Vice President for Extension and Public Service*, 1975
B.S., Murray State University; M.S., Ph.D., University of Kentucky.
- VALLERY, H. F. *Assistant to the President*, 1950, 1960
B.A., M.A., Louisiana State University; M.A., Ed.D., Columbia University.
- BARNES, BENJAMIN B. *Director of Computer Center and Associate Professor (Electrical Engineering)*, 1963
B.E.E., Auburn University; M.S.E.E., University of Alabama; Ph.D., Auburn University.
- CATER, KATHARINE C. *Dean of Women and Social Director*, 1946
A.B., Limestone College; M.A., Mercer University; M.S., Syracuse University; Litt.D., Limestone College.
- DODGE, ENCEL H. *Director of Contract and Grant Development*, 1968
B.S., Purdue University; M.S., Washington University.
- FOY, JAMES E. *Dean of Student Affairs, and Associate Professor (Counselor Education)*, 1950, 1960
A.B., M.A., University of Alabama; Ph.D., Michigan State University.
- FUNCHESS, LINWOOD E. *Director of Buildings and Grounds*, 1957
B.S., Auburn University; M.S., Cornell University.
- GUERIN, WILLIAM H. *Campus Planner and Architect*, 1967
B.Arch., University of Florida.
- HAYLEY, LEE R. *Director of Athletics*, 1972
B.S., M.S., Auburn University.
- HIGHFILL, WILLIAM C. *Director of Libraries and Librarian IV*, 1973
A.B., Oklahoma Baptist University; M.S., Kansas State Teachers College; Ph.D., University of Illinois.
- LEISCHUCK, GERALD S. *Director of Institutional Analysis*, 1963, 1966
A.B., M.A., Colorado State College; Ed.D., Auburn University.
- SCHULTZ, ROBERT G. *Director of University Personnel Services*, 1974
B.A., University of Florida; M.A., University of North Carolina.
- PARKS, PAUL F. *Dean of The Graduate School and Professor (Animal & Dairy Sciences)*, 1965, 1972
B.S., M.S., Auburn University; Ph.D., Texas A&M University.
- RILEY, RHETT E. *Business Manager and Treasurer*, 1963, 1973
B.S., Auburn University.
- SARVER, JOSEPH B. *Executive Secretary of Alumni Association, Director of Auburn Development Program*, 1951, 1960
B.S., Auburn University.
- TINCHER, WILBUR A., JR. *Director of Educational Services and Professor (Educational Administration)*, 1958, 1966
A.B., M.A., Ed.D., University of Kentucky.

- WARMAN, JAMES C. *Director of Water Resources Research Institute and Associate Professor (Civil Engineering)*, 1965, 1970
A.B., M.S., West Virginia University.
- WEGENER, EDWARD P. *Director of Educational Television*, 1954
B.S., University of Minnesota.
- WHITE, J. HERBERT *Director of University Relations*, 1960, 1965
B.S., Auburn University.
- WHITE, LOUIS EDWARD *Conference Director*, 1962, 1969
B.S., Auburn University; M.S., University of Alabama; Ed.D., North Carolina State University.

ACADEMIC ADMINISTRATIVE OFFICERS AND FACULTY

- ROUSE, R. DENNIS *Dean of School of Agriculture and Director of Agricultural Experiment Station System*, 1949, 1972
B.S., M.S., University of Georgia; Ph.D., Purdue University.
- MCPHEETERS, E. KEITH *Dean of School of Architecture and Fine Arts and Professor (Architecture)*, 1969
B.Arch., Oklahoma State University; M.F.A. in Architecture, Princeton University.
- HOBBS, EDWARD H. *Dean of School of Arts and Sciences and Professor (Political Science)*, 1967
A.B., University of North Carolina; M.A., University of Alabama; Ph.D., Harvard University.
- HORTON, GEORGE R., JR. *Dean of School of Business and Professor (Marketing and Transportation)*, 1968, 1973
B.S., M.S., Auburn University; Ph.D., University of Virginia.
- BLACKBURN, JACK E. *Dean of School of Education*, 1975
B.S., Florida State University; M.A. Peabody College; Ed.D., New York University.
- HANEMAN, VINCENT S., JR. *Dean of School of Engineering, Director of Engineering Experiment Station and Professor (Aerospace Engineering)*, 1972
S.B., Massachusetts Institute of Technology; M.S.E., Ph.D., University of Michigan.
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B.App.A., M.E.M., Auburn University.
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B. Arch., University of Kentucky; M. Arch., University of Illinois.
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B.A., Baylor University; B.D., Southern Baptist Theological Seminary; S.T.M., Th.D., Harvard University.
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A.B., University of Montevallo; B.S., M.S., Columbia University.

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B.A., Auburn University at Montgomery.
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B.S., Troy State University; M.S., Ph.D., Auburn University.
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B.S., Gujarat University, India; M.S., Tuskegee Institute.
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B.Arch., M.Arch., Georgia Institute of Technology.
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B.A., Tulane University; M.S., Ph.D., Auburn University.
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B.S.F., M.S., Ph.D., Purdue University.
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B.S., Cornell University; M.B.A., George Washington University.
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B.A., Georgia State University; M.Ed., Ph.D., University of Georgia.
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B.A., Auburn University.
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B.B.A., University of Minnesota; M.B.A., Auburn University.
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B.S., Mississippi State University; D.V.M., M.S., Auburn University; Ph.D., University of Missouri.
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B.S., Auburn University.
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B.B.A., University of Iowa; M.B.A., Memphis State University; D.B.A., Mississippi State University.
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B.S., Medical College of Virginia; Ph.D., Virginia Commonwealth University.
- BEIGHTOL, LARRY *Assistant Football Coach*, 1976
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B.A., M.A., M.S.L., Ed.D., Western Michigan University.
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B.S., M.S., University of Maryland; Ph.D., Vanderbilt University.
- BELL, ROBERT L. *Radiological Safety Officer, Radiological Safety*, 1971
B.S., Purdue University.
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B.S., M.S., Auburn University; Ph.D., Michigan State University.
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B.S., Bryant College; M.B.A., Washington University; Ph.D., Florida State University.
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B.S., M.S., Northeastern University; Ph.D., University of Connecticut.

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B.A., M.A., Ph.D., Vanderbilt University.
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B.S., M.S., Oklahoma State University; Ph.D., Auburn University.
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B.S., M.S., University of South Carolina.
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B.S.M., Baldwin-Wallace College; M.A., Professional Diploma, "Specialist in Music Education," Ed.D.,
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B.S., D.V.M., Purdue University; M.S., Ph.D., University of Wisconsin
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B.S., Ph.D., University of Mississippi.
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B.S., Auburn University.
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B.S., Auburn University.
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B.A., Colgate University; Sc.M., Brown University; Ph.D., Yale University
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- LAUDERDALE, WILLIAM B. *Associate Professor (Foundations of Education)*, 1964, 1970
B.S., Ed.M., University of Illinois; Ph.D., Michigan State University.
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B.S., M.S., Ph.D., Auburn University.
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B.M., M.S., Julliard School of Music.
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B.S., M.A., University of Alabama.
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B.S., State University College at Buffalo; M.A., Niagara University; M.L.S., University of Oklahoma; Ph.D., University of Birmingham, England.
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B.S., Seoul National University; M.S., University of South Carolina; Ph.D., Iowa State University.
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B.S., University of Alabama; M.Ed., Auburn University.
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B.A., M.S., University of Wisconsin.
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B.A., M.A., Pennsylvania State University; Ph.D., Cornell University.
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B.A., University of Northern Iowa; M.A., University of Iowa; Ph.D., University of Iowa.
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B.S., Presbyterian College; M.S., Ph.D., Emory University.
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B.S., M.S., Sam Houston State College; Ph.D., Texas A&M University.
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B.S., M.A., Auburn University.
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B.A., Mississippi College; M.Ed., Louisiana State University.
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B.S., University of Georgia.
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Aquacultures), 1972
B.A., Miami University; M.S., University of Wisconsin; Ph.D., Auburn University.
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B.A., Auburn University.
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B.E.E., M.E., Auburn University; Ph.D., University of Florida.
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B.S., University of Kentucky; M.S., North Carolina State University; Ph.D., University of Minnesota.
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B.S., M.S., Oklahoma State University.
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B.S., M.S., North Carolina State University; Ph.D., University of Leeds.
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B.S., Auburn University.
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B.S., M.S., Tuskegee Institute.
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B.S., M.S., D. of Engr., University of Kentucky.
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B.S., M.S., Ph.D., Memphis State University.
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B.S., D.V.M., Kansas State University
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B.S., M.Ed., Auburn University.
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B.S., M.A., Ph.D., University of Missouri.
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B.S., Auburn University.
- McDaniel, GAYNER R. Associate Professor (Poultry Science), 1968
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Education), 1972, 1975
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B.S., Purdue University; M.S., Indiana University; Ph.D., Purdue University.
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University Relations, 1962
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B.A., B.Sc., M.A., Ph.D., Ohio State University
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B.S., D.V.M., Purdue University; M.S., Ph.D., Iowa State University.
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B.A., Alma College; B.D., College of the Bible (Kentucky); M.A., University of Kentucky; Diploma, University of Geneva (Switzerland); Ph.D., Florida State University.
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B.S.E.E., University of Idaho; Lieutenant, U.S. Navy.
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A.B., M.A., University of Alabama; Ph.D., University of North Carolina.
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B.S., Georgia Southern College.
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B.S., M.A., University of Minnesota; Ed.D., University of California Los Angeles.
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B.S., Michigan Technological University; M.S., University of Illinois.
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B.S., Bradley University; M.S., University of Chicago; Ph.D., Loyola University of Chicago.
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Ph.B., A.M., University of Chicago.
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M.P.S., Western Kentucky University.
- Merritt, CLEMENTS B. Associate Director of Operations, Auburn University, 1976
B.M.E., University of Florida; M.S., Air Force Institute of Technology.
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B.S., Memphis State University.
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B.S.I.M., M.S.I.M., Georgia Tech; Ph.D., University of Georgia.
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B.S., Brigham Young University; M.S., Ph.D., Stanford University.
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B.S., M.S., University of Southern Mississippi; Ed.D., University of Georgia.
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B.S., McPherson College; M.S., Emporia State Teachers College; Ed.D., Kansas University.

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R.N., University of Minnesota.
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B.S., Kent State University; M.A., Kansas State Teachers College; Ph.D., Wayne State University.
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B.S., Berry College; M.S., Stout State University; Ed.D., Indiana University.
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D.V.M., M.S., Auburn University; Ph.D., Purdue University.
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B.A., M.T., Central State University.
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A.B., University of Michigan; M.A., Eastern Michigan University.
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B.Arch., M.Arch., University of Michigan.
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D.V.M., Auburn University.
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B.A., M.A., University of Tennessee.
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Animal Surgery & Medicine), 1967, 1972
D.V.M., M.S., Auburn University.
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B.A., Auburn University.
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B.S., Agra University, India; M.A., University of Maine; Ph.D., North Carolina State University.
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B.S., M.S.C.E., Drexel University; Ph.D., Stanford University.
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B.S., University of New Mexico; M.S., New Mexico State University; Ph.D., Kansas State University.
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B.S., Ch.E., Georgia Institute of Technology; M.S., Ph.D., University of Alabama.
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B.S., Auburn University; M.A., University of Alabama; M.Sc., Shippensburg State College; Colonel, U.S. Army.
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A.B., Regis College; M.A., Fordham University.
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B.S., Auburn University; M.S., Ph.D., Ohio State University.
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B.S., M.S.M.E., Auburn University.
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B.S., M.S., Mississippi State University; Ph.D., University of Wisconsin.
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B.S., Auburn University.
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A.S., Enterprise State Junior College; B.A., Auburn University.
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A.B., Friends University; M.A., Ph.D., Indiana University.
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B.C.E., M.S., Auburn University.
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B.S., M.S., University of Florida.
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B.S., M.S., Auburn University; Ph.D., University of Wisconsin; LL.B., Jones Law School.
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A.B., M.S.W., University of North Carolina.
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A.B., Talladega College; M.A., University of Michigan; Ph.D., University of Minnesota.
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B.S., M.S., Georgia Southern University; Ed.D., Auburn University.
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D.V.M., M.S., Auburn University.
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B.A., Wofford College; M.A., Western Carolina University.
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of Business, 1969
- RICHARDSON, ROBERT S. Adjunct Assistant Professor (Music), 1975
B.S., M.Ed., Auburn University.
- RICHARDSON, DON R. Assistant Dean of Graduate School, Associate
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B.S., Auburn University; M.A., Ph.D., Ohio University.
- RIDENHOUR, CALVIN Assistant Professor (Naval Science), 1972
B.S., University of North Carolina; Lieutenant, U.S. Navy.
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B.S., West Virginia University; M.S., Auburn University.
- RIPLEY, ROBERT F. Flight Instructor (Auburn School of Aviation), 1973
B.A., Bowling Green State University.
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B.S., Arkansas State University; M.A., University of Kentucky.
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B.A., Georgetown College; M.A., Ph.D., Louisiana State University.
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B.S.C., M.A., Ph.D., University of Iowa.
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B.S., Wofford College; M.A., University of North Carolina.
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B.S., Moorhead State College; M.A., State University of New York; Ph.D., University of Washington.
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Services Education), 1975, 1976
A.A., Southern Union State Jr. College; B.S., M.Ed., Auburn University.
- ROBERTS, CHARLES B. Director, Student Financial Aid, 1968, 1970
B.S., M.S., Auburn University.
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D.V.M., Auburn University; M.S., Michigan State University.
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B.S., M.S., Jacksonville State University.
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B.S., University of Kentucky; D.V.M., M.S., Auburn University.
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B.S., M.S., University of Tennessee; Dr. P.A., Harvard University.
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B.S., University of Kentucky; Ph.D., Emory University.
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B.S., Auburn University; M.A., Ph.D., University of Alabama.
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B.S., M.S., Auburn University; D.B.A., Georgia State University.
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B.S., M.S., Southern Illinois University; Ed.D., Auburn University.
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B.S., Clemson University; M.S., Ph.D., North Carolina State University.
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B.S., Auburn University.
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B.E.E., M.S., Auburn University; Ph.D., Duke University.

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B.A., Lafayette College; Ph.D., Yale University.
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B.S., Virginia Polytechnic Institute; M.S., Michigan State University; Ph.D., Iowa State University.
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B.S., M.S., Virginia Polytechnic Institute; Ph.D., University of Illinois.
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B.S., M.A., University of Iowa.
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B.M., University of Arizona; M.M., University of Arkansas.
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B.S., Auburn University; M.A., Louisiana State University.
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B.S., M.S., Auburn University; Ph.D., Ohio State University.
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B.S., Michigan College of Mining and Technology; M.S., Auburn University.
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B.S., Arkansas A&M College; M.S., University of Arkansas; Ph.D., University of Maryland.
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B.S., M.S., Ph.D., University of Southern Mississippi.
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A.B., Huntingdon College; M.L.S., Emory University.
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B.S., Auburn University.
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B.S., Southern Illinois University.
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B.M., Samford University; M.A., University of Iowa; D.M.A., University of Colorado.
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B.A., Brigham Young University; M.A., University of Kentucky.
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B.A., University of Utah; M.A., University of Minnesota.
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B.F.A., M.F.A., University of Illinois.
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B.S., University of Richmond; Ph.D., University of North Carolina.
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B.A., M.A., Hardin Simmons University; Ph.D., Michigan State University.
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B.A., M.A., Florida State University.
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B.S., Auburn University; M.S., Florida State University.
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B.S., Emory-Riddle Aeronautical University.
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B.S., Birmingham-Southern College; M.S., Tulane University; M.A., University of Michigan.
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B.S., Ohio State University; M.A., Colorado State University.
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B.B.C., B.C.E., Auburn University.
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B.M., Auburn University; M.M., Washington University.
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B.C.E., M.B.A., Marquette University; D.B.A., University of Oklahoma.
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B.A., Webster College; M.A., University of Denver.
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B.A., M.Ed., Ed.D., University of Houston.
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B.S., M.A., Murray State University; M.F.A., Indiana University.
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B.S., Auburn University; M.S., University of Pittsburgh; Ph.D., Oklahoma State University.

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B.Sc., Ph.D., University of Sheffield, England.
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A.B., University of Alabama; M.D., Washington University.
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B.M., Curtis Institute of Music.
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B.S., Southern Mississippi University.
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B.S. Arch., Washington University; M.Arch., Harvard University; Ph.D., University of Pennsylvania.
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B.S., M.Ed., Auburn University.
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B.S.T.E., Clemson University; M.S., Institute of Textile Technology.
- WATKINS, JAMES F. *Associate Dean and Associate Professor (Educational Administration)*, 1969, 1973
B.I.E., Georgia Institute of Technology; M.Ed., Ed.D., Auburn University.

- WATSON, JACK E. Associate Professor (Zoology & Entomology), 1965, 1971
B.S., Shippensburg State College; M.S., Ph.D., Purdue University.
- WATSON, JOYCE A. Counselor (Family & Child Development), 1975
B.S., Shippensburg State College; M.S., Purdue University.
- WATSON, WILLIAM H. Assistant Director, Student Financial Aid, 1972
B.A.E., University of Florida.
- WEAR, JOHN I. Professor (Agronomy & Soils), 1939, 1959
B.S., M.S., Auburn University; Ph.D., Purdue University.
- WEAVER, ANDREW M. Professor (Education), 1960, 1969
B.S., Tennessee Technological University; M.A., Ed.D., University of Tennessee.
- WEBB, THOMAS R. Assistant Professor (Chemistry), 1975
B.S., Oregon State University; Ph.D., Iowa State University.
- WEBSTER, DENNIS B. Associate Professor (Industrial Engineering), 1970, 1975
B.S.I.E., M.S.I.E., West Virginia University; Ph.D., Purdue University.
- WEETE, JOHN D. Assistant Professor (Botany & Microbiology), 1972
B.S., M.S., Stephen F. Austin State University; Ph.D., University of Houston.
- WESTERGAARD, JORGEN M. Adjunct Instructor (Microbiology), 1973
Diploma V.M., D.V.M., Royal School of Veterinary Studies in the University of Edinburgh.
- WESTMORELAND, THOMAS Youth Coordinator (Family and Child Development), 1973
A.A., Austin State Junior College; B.A., Morehead State College.
- WHATELY, JAMES W., JR. Instructor (English), 1972
B.A., Auburn University; M.F.A., University of North Carolina.
- WHEATLEY, WALTER B. Associate Professor (Chemistry), 1966, 1975
B.S., Birmingham-Southern College; M.T., (ASCP) Lloyd Noland Foundation; M.S., Auburn University.
- WHIDDEN, DAVID L., JR. Assistant Professor (Military Science), 1972
B.S., U.S. Military Academy; Major, U.S. Army.
- WHITE, CHARLES RAYMOND Associate Professor (Industrial Engineering), 1966
B.S.M.E., M.S.I.E., Ph.D., I.E., Purdue University.
- WHITE, MORRIS Professor (Agricultural Economics &
Rural Sociology), 1950, 1960
B.S., Auburn University; M.S., Ph.D., Purdue University.
- WHITTEN, DAVID O. Associate Professor (Economics), 1968, 1974
B.S., College of Charleston; M.A., University of South Carolina; Ph.D., Tulane University.
- WIDELL, ROBERT W. Assistant Professor (Political Science), 1972, 1974
A.B., Duke University; Ph.D., Stanford University.
- WIETERS, C. DAVID Assistant Professor (Management), 1976
B.M.E., Cornell University; M.B.A., University of Rochester; D.B.A., Arizona State University.
- WIGGINS, AGEE M. Professor (Large Animal Surgery & Medicine), 1946, 1959
D.V.M., Auburn University; M.S., Kansas State University.
- WIGGINS, EARL L. Professor (Animal & Dairy Sciences), 1956, 1973
B.S., M.S., Oklahoma State University; Ph.D., University of Wisconsin.
- WIGGINS, LORNA A. Librarian II and Business Librarian
(Library), 1968, 1974
B.A., Agnes Scott College; M.L.S., Emory University.
- WIGGINS, MATTHEW D. Assistant Professor (Small Animal
Surgery & Medicine), 1974
D.V.M., Auburn University.
- WILBANKS, JAMES R. Assistant Director (Engineering Extension
Service), 1956, 1975
B.M.E., M.M.E., Auburn University.
- WILBANKS, MARY E. Librarian II and Special Collections
Librarian (Library), 1959, 1962
A.B., University of Montevallo; M.A., Emory University; M.S.L.S., University of North Carolina.
- WILCOX, ROY C. Associate Professor (Mechanical Engineering &
Materials Engineering), 1969
B.S., M.S., Virginia Polytechnic Institute; Ph.D., University of Missouri.
- WILDER, CECIL C. Adjunct Assistant Professor (Music), 1973
B.S., M.Ed., Auburn University.
- WILDER, DAVID T. Instructor (Small Animal Surgery and Medicine), 1974
B.S., D.V.M., Auburn University.
- WILKEN, LEON O., JR. Professor (Pharmacy), 1963, 1972
B.S., Loyola University; M.S., Ph.D., University of Texas.
- WILKE, ARTHUR S. Assistant Professor (Sociology), 1975
B.S., University of Wisconsin; M.A., Ph.D., University of Minnesota.
- WILKERSON, W. ALFRED Instructor (Architecture), 1975
B.I.D., Auburn University; M.F.A., Cranbrook Academy of Art.

- WILKINSON, PAUL K. Assistant Professor (Pharmacy), 1975
B.S., University of Connecticut; M.S., Ph.D., University of Michigan
- WILLARD, JULIA L. Assistant Professor (Division of Education), 1968, 1972
B.A., B.S., Jacksonville University; M.Ed., Auburn University
- WILLIAMS, BYRON B. JR. Professor (Pharmacy), 1951, 1962
B.S., M.S., Ph.D., University of Florida
- WILLIAMS, DOUGLAS F. Assistant Professor and Coordinator of
Graduate Programs for Junior College Faculty (Educational Administration), 1970
B.A., Northern Michigan University; M.A., University of Michigan; Ph.D., University of Texas
- WILLIAMS, DUDLEY O. Television Program Director, Educational
Television, 1966, 1968
B.A., University of Kentucky
- WILLIAMS, EDWARD T. Superintendent of Maintenance and Operations and
Assistant Director, Buildings & Grounds, 1973
B.S., M.E., Auburn University
- WILLIAMS, ELIZABETH GRIMES ... Assistant Professor (Accounting & Finance), 1946, 1959
B.S., M.S., Auburn University
- WILLIAMS, ERNEST Professor (Mathematics), 1934, 1948
B.S., Birmingham-Southern College; M.S., Auburn University; Ph.D., University of Michigan
- WILLIAMS, HAROLD H. Assistant Professor (Vocational & Adult
Education), 1972
B.S., M.A., University of North Alabama; Ph.D., Colorado State University
- WILLIAMS, HUGH O. Professor (Art), 1957, 1965
B.A., Auburn University; A.M., Columbia University
- WILLIAMS, JOAN Instructor (English), 1974
B.S., Stetson University; M.A., Mississippi State College for Women
- WILLIAMS, JOHN C., JR. Associate Professor (Botany & Microbiology), 1970
B.S., M.S., North Carolina State University; Ph.D., Iowa State University
- WILLIAMS, JOHN R., JR. Assistant Professor (Physics), 1974
B.S., North Georgia College; Ph.D., North Carolina State University
- WILLIAMS, L. B. Editor, University Publications, University Relations, 1956, 1962
B.S., Troy State University; M.S., Peabody College
- WILLIAMS, MICHAEL L. Assistant Professor (Zoology-Entomology), 1973
B.S., Arkansas State University; M.S., Ph.D., Virginia Polytechnic Institute and State University
- WILLIAMS, PAUL J. Assistant Registrar, Registrar's Office, 1973
B.S., Auburn University; M.A., University of Alabama at Birmingham
- WILLIAMSON, EDWARD C. Professor (History), 1957, 1970
A.B., M.A., University of Florida; Ph.D., University of Pennsylvania
- WILLIS, T. HILLMAN Assistant Professor (Management), 1974
B.S., Louisiana State University; M.B.A., Memphis State University; Ph.D., Louisiana State University
- WILMOTH, HELGA H. Instructor (Foreign Language), 1974
B.A., M.A., Ball State University
- WILMOTH, JAMES N. Assistant Professor (Foundations of Education), 1970, 1975
B.S., Marshall College; M.S., Ph.D., Wayne State University
- WILSON, ANN D. Assistant Program Director (Auburn Union), 1974
B.S., King College
- WILSON, G. DENNIS Assistant Professor (Health, Physical
Education & Recreation), 1973
B.S., Union University; M.S., Ed.D., University of Tennessee
- WILSON, JAMES D. Construction Engineer (Buildings & Grounds), 1975
B.S., University of Arkansas
- WILSON, JANE A. Assistant Professor (Zoology-Entomology), 1968
B.S., Limestone College; M.S., Ph.D., Clemson University
- WILSON, LENDA JO Instructor (Consumer Affairs), 1971
B.S., Louisiana Polytechnic University; M.S., Louisiana State University
- WILSON, LOWELL E. Professor (Agricultural Economics &
Rural Sociology), 1960, 1968
B.S., Murray State University; M.S., University of Kentucky; Ph.D., University of Illinois
- WILSON, STANLEY P. Associate Director & Assistant Dean
(School of Agriculture), 1975
B.S., M.S., Auburn University; Ph.D., Oklahoma State University
- WILT, GERALD R. Assistant Professor (Botany & Microbiology), 1962, 1965
B.S., Western Kentucky State University; M.S., Clemson University
- WINGARD, JOHN W. Assistant Professor (Technical Services), 1957, 1962
B.S., M.S., Auburn University

- WINGARD, RICHARD M. *Director, Food Service*, 1974
B.S., Virginia Polytechnic Institute.
- WINKLER, JOHN K. *Associate Professor (Large Animal Surgery & Medicine)*, 1962, 1963
D.V.M., Colorado State University.
- WOLVERTON, CLYDE I. *Assistant Professor (Foreign Languages)*, 1966, 1975
B.A., University of Akron; M.A., University of Georgia.
- WOMACK, DENNIS K. *Administrative Assistant (Athletic Department)*, 1975
B.S., M.S., Auburn University.
- WOODALL, JAMES R. *Professor (English)*, 1952, 1965
B.S., Murray State University; M.A., University of Kentucky; Ph.D., Vanderbilt University.
- WOODHAM, JEAN *Associate Professor (Art)*, 1971, 1974
B.A.A., Auburn University.
- WORLEY, SHELBY D. *Assistant Professor (Chemistry)*, 1974
B.S., Auburn University; Ph.D., University of Texas.
- WRIGHT, CLARENCE D. *Coordinator (Learning Resources Center) and Assistant Professor (Educational Media)*, 1970, 1972
B.S., University of Alabama; M.E., E.Ed., Auburn University.
- WRIGHT, JONE P. *Associate Professor (Elementary Education)*, 1968, 1975
B.S., M.Ed., University of Georgia; Ph.D., University of Alabama.
- WRIGHT, RUTH L. *Instructor (English)*, 1958, 1965
B.A., LaGrange College; M.A., Auburn University.
- WRIGHT, THOMAS L. *Associate Professor (English)*, 1960, 1964
B.A., M.A., Ph.D., Tulane University.
- YARBROUGH, CECIL S., JR. *Adjunct Professor (Veterinary Medicine)*, 1972
D.V.M., Auburn University.
- YATES, S. BLAKE *Assistant to the Dean and Instructor (Pharmacy)*, 1970
B.S., Auburn University; M.S., University of Florida.
- YEAGER, JAMES H., JR. *Assistant Professor (Economics)*, 1974
A.A., Florida Keys Community College; B.A., Florida Atlantic University; Ph.D., Texas A&M University.
- YEAGER, JOSEPH H. *Professor and Head (Agricultural Economics & Rural Sociology)*, 1946, 1964
B.S., M.S., Auburn University; Ph.D., Purdue University.
- YERKEY, JAMES R. *Assistant Bursar, Business Office*, 1972
- YIELDING, KATRINA *Assistant Professor (Secondary Education)*, 1965, 1967
B.S., M.S., Ed.D., Auburn University.
- YOUNG, DIANE W. *Assistant Professor (Zoology-Entomology)*, 1971
B.S., Ph.D., University of Utah.
- YOUNG, FRANK, JR. *Assistant Football Coach*, 1974
B.S., Delta State College; M.E., Mississippi College.
- YOUNG, LUTHER M. *Associate Professor (Health, Physical Education & Recreation)*, 1944, 1959
B.S., M.S., Auburn University.
- YOUNG, ROY E. *Assistant Professor (Agricultural Engineering)*, 1972
B.S., North Carolina State University; M.S., Iowa State University; Ph.D., North Carolina State University.
- YOUNG, SAM W. *Associate Professor (Mathematics)*, 1975
B.A., M.A., Ph.D., University of Texas.
- YOUNG, SAMUEL L. *Instructor (Large Animal Surgery)*, 1974, 1975
D.V.M., Auburn University.
- YOUNGBLOOD, ELLIS E. *Instructor (Electrical Engineering)*, 1972
B.E.E., M.S., Auburn University.
- YOUNGE, CLARY W. *Admissions & Financial Aid Counselor (Educational Services)*, 1974
B.S., M.Ed., Tuskegee Institute.
- YU, JAMES C. M. *Associate Professor (Mechanical Engineering)*, 1967, 1971
B.S., National Taiwan University; M.S., Virginia Polytechnic Institute; Ph.D., Auburn University.
- ZABEL, GEORGE L. *Assistant Professor (Animal & Dairy Sciences)*, 1970
B.S., M.S., Kansas State University; Ph.D., Virginia Polytechnic Institute.
- ZALOOM, VICTOR ANTHONY *Assistant Professor (Industrial Engineering)*, 1970
B.S.I.E., M.S.I.E., University of Florida; Ph.D., University of Houston.
- ZENOR, PHILLIP L. *Associate Professor (Mathematics)*, 1968, 1972
B.S., M.S., Ph.D., University of Houston.
- ZIEGLER, PAUL F. *Associate Professor (Chemistry)*, 1949, 1958
B.S., Otterbein College; M.S., Ph.D., University of Cincinnati.

- ZMUD, ROBERT W. Assistant Professor (Management), 1976
B.A.E., University of Virginia; M.S., Massachusetts Institute of Technology; Ph.D., University of Arizona.
- ZWIRN, ROBERT Assistant Professor (Architecture), 1970
B.S., B.Arch., Rensselaer Polytechnic Institute; M.Arch., University of Oregon; LL.B., Jones Law School.

EMERITI

- ADAMS CLEVELAND L. Professor Emeriti, Textile Engineering, January, 1976
B.T.E., Auburn University
- ALLEN, ROGER W. Dean Emeritus, School of Science and Literature, June, 1967
B.S., M.S., Auburn University; M.S., University of Michigan; Ph.D., Columbia University
- ALVORD, BEN FINLEY Professor Emeritus, Research Data Analysis, June, 1966
B.S., M.S., University of Illinois
- ANSON, CHARLES P. Professor Emeritus, Economics and Geography, June, 1972
A.B., University of Wisconsin; M.A., Ohio State University; Ph.D., University of North Carolina
- APPLEBEE, FRANK W. Professor Emeritus, Art, August, 1969
Diploma, Massachusetts College of Art; B.S., M. App. Art, Auburn University
- ARANT, F. S. Professor Emeritus, Zoology-Entomology, July, 1975
B.S., M.S., Auburn University; Ph.D., Iowa State University
- BARKSDALE, ROBBIE A. Librarian III Emeritus, July, 1976
A.B., University of Montevallo; B.S., M.S., Columbia University
- BEARD, G. W. Director Emeritus, Athletics, June, 1972
B.S., Auburn University
- BOTTOMS, DAVID NEWTON Associate Professor Emeritus, Vocational
and Adult Education, August, 1972
B.S., M.S., Auburn University
- BURKHART, E. WALTER Professor Emeritus, Architecture, June, 1964
B.S., Arch., Washington State University; M.S., Arch., Columbia University
- CAPPS, JULIUS DANIEL Professor Emeritus, Chemistry, June, 1974
B.S., M.S., Auburn University; Ph.D., University of Nebraska
- COBB, CHARLES N. Professor Emeritus, Industrial Engineering, December, 1970
B.S., Clemson University; B.I.E., M.S., Auburn University
- DAVIS, FRANK B. Professor Emeritus, Speech
Communication, June, 1974
B.A., Hendrix College; M.A., University of Iowa; Ph.D., Louisiana State University
- DAVIS, W. L. Professor Emeritus, Education, July, 1975
B.S., Middle Tennessee State University; M.A., Peabody College; Ed.D., Columbia University
- EATON, W. H. Associate Professor Emeritus, Dairy Husbandry, March, 1961
B.S., North Carolina State University
- EDWARDS, CHARLES WESLEY Registrar Emeritus, June, 1968
B.S., Auburn University; M.A., Harvard University
- ELIZONDO, YNDALECIO ANDRES Associate Professor Emeritus,
Mechanical Engineering, June, 1966
B.S.C.E., B.S.M.E., M.S., Auburn University
- FRANCIS, WILLIAM HUGH Professor Emeritus, Technical Services, June, 1971
B.S., M.S., Auburn University
- GARIN, GEORGE I. Professor Emeritus, Forestry, June, 1972
B.S., M.S., University of Idaho; Ph.D., Yale University
- GIBBONS, WALTER J. Professor Emeritus, Large Animal Surgery
and Medicine, December, 1972
D.V.M., M.S., Cornell University
- GLYDE, EDGAR C. Professor Emeritus, Music, June, 1974
F.T.C.L., L.Mus.T.C.L., I.R.A.M., L.T.C.L. (London, England)
- GOODMAN, JOHN G. Associate Professor Emeritus,
Poultry Science, August, 1973
B.S., M.S., Auburn University
- GOSSER, LEO G. Professor Emeritus, English, June, 1967
B.S., Kirksville State College; Ph.D., University of Chicago
- GRIMES, J. C. Professor Emeritus, Animal Husbandry and Nutrition, March, 1961
B.S., University of Tennessee; M.S., University of Kentucky
- GRITZ, IRVIN B. Associate Professor Emeritus, Accounting and Finance, June, 1972
B.S., M.S., Oklahoma State University
- GUYTON, FAYE E. Professor Emeritus, Zoology-Entomology, June, 1963
B.S., M.S., Ohio State University
- HAINES, PAUL Professor Emeritus, English, July, 1975
B.S., Lafayette College; M.A., Ohio Wesleyan University; Ph.D., New York University

- HEATH, MCKENZIE *Professor Emeritus, Small Animal Surgery and Medicine, July, 1968*
D.V.M., Auburn University.
- HOCKING, GEORGE M. *Professor Emeritus, Pharmacy, September, 1975*
B.S.P., University of Washington; M.S.P., Ph.D., University of Florida.
- HOLLOWAY, OTTO *Professor Emeritus, Foundations of Education, August, 1972*
B.S., M.S., Auburn University; Ed.D., Columbia University.
- HUGHES, GORDON *Professor Emeritus, Physics, June, 1970*
B.A., Oberlin College; M.A., Ph.D., University of Illinois.
- HUNTLEY, MICHEL C. *Dean Emeritus, Faculties, July, 1968*
B.A., Millsaps College; M.A., Emory University; L.L.D., Millsaps College; Litt.D., University of Miami.
- HUTSELL, WILBUR HALL *Professor Emeritus, Athletic Department, June, 1963*
A.B., University of Missouri.
- IKENBERRY, ERNEST *Professor Emeritus, Mathematics, June, 1975*
B.A., Ottawa University; M.S., University of Kansas; Ph.D., Louisiana State University.
- INGRAM, W. T. *Business Manager and Treasurer Emeritus, June, 1973*
- INGRAM, FORNEY H. *Associate Professor Emeritus, Technical Services, June, 1972*
B.S.C.E., M.C.E., Auburn University.
- ISBELL, C. L. *Professor Emeritus, Horticulture, March, 1961*
B.S., Auburn University; M.S., Ph.D., Michigan State University.
- IVEY, OLIVER T. *Professor Emeritus, History, August, 1969*
B.S., M.S., Auburn University; M.A., University of Chicago.
- JOHNSON, SIDNEY W. *Associate Professor Emeritus, Political Science, March, 1970*
B.S., M.S., Auburn University.
- JOHNSON, W. A. *Associate Professor Emeritus, Horticulture, January, 1975*
B.S., M.S., Auburn University.
- KING, DALE F. *Professor Emeritus, Poultry Science, July, 1967*
B.S., Oregon State University; M.S., Kansas State University.
- KUDERNA, JEROME *Professor Emeritus, Education, June, 1962*
B.S., M.A., Michigan State University.
- LAMAR, MARY GEORGE *Associate Professor Emerita, Management, September, 1974*
B.S., Auburn University; M.A., New York University.
- LAND, JAMES E. *Professor Emeritus, Chemistry, June, 1975*
B.S., Clemson University; M.S., Tulane University; Ph.D., University of North Carolina.
- LAND, JEANNETTA T. *Professor Emerita, Health, Physical Education and Recreation, September, 1974*
B.S., University of Alabama; M.A., Columbia University.
- MARTY, EDWARD C. *Professor Emeritus, Building Technology, June, 1972*
B.Arch., M.Arch., Auburn University.
- MCLEOD, FRANCES R. *Associate Professor Emerita, English, July, 1975*
A.B., Huntingdon College; M.S., Auburn University.
- METZGER, A. B. *Associate Professor Emeritus, Political Science, August, 1974*
B.B.A., University of Chattanooga; M.A., Auburn University.
- MOORE, JOHN RICHARD *Professor Emeritus, English, 1964*
A.B., Tulane University; A.M., Ph.D., Harvard University.
- MOORE, JOSEPH C. *Associate Professor Emeritus, Horticulture, December, 1970*
B.S., Auburn University; M.S., Washington University.
- MOORE, OMAR C. *Associate Professor Emeritus, Chemical Engineering, September, 1969*
B.S., M.S., Auburn University.
- NEAL, JAMES E. *Professor Emeritus, Microbiology, December, 1971*
B.S., Mississippi State University; D.V.M., Auburn University; M.S., Texas A&M University.
- NEAL, JESSE H. *Professor Emeritus, Agricultural Engineering, August, 1967*
B.S., Kansas State University; M.S., University of Minnesota; Ph.D., University of Missouri.
- NICHOLS, GROVER TYLER *Associate Professor Emeritus, Electrical Engineering, December, 1973*
B.E.E., Auburn University; M.S., Georgia Institute of Technology.
- NICHOLS, JR., SAMUEL HARDING *Professor Emeritus, Chemistry, June, 1974*
A.B., Centre College of Kentucky; M.S., Ph.D., Ohio State University.
- ORR, FRANK MARION *Professor Emeritus, Building Technology, June, 1971*
B.S., M.Arch., Auburn University.
- OTTIS, KENNETH *Professor Emeritus, Zoology-Entomology, June, 1973*
B.S., Dakota Wesleyan University; M.S., Ph.D., Iowa State University.

- PARKER, WILLIAM *Dean Emeritus of the Graduate School and
Professor Emeritus, Mathematics, June, 1972*
A.B., M.A., University of North Carolina; Ph.D., Brown University.
- PARTIN, ROBERT L. *Professor Emeritus, History, June, 1970*
B.S., Middle Tennessee State University; M.A., Ph.D., Peabody College.
- PEARSON, ALLEN M. *Professor Emeritus, Zoology-Entomology, December, 1971*
B.S., Auburn University; M.S., Ph.D., Iowa State University.
- PEET, HELEN H. *Librarian III Emeritus, July, 1976*
B.A., Mississippi Woman's College; M.A., Tulane University.
- PRUETT, H. T. *Associate Professor Emeritus, Vocational and
Adult Education, May, 1971*
B.S., M.Ed., Auburn University.
- PUMPHREY, FRED H. *Dean Emeritus, School of Engineering, June, 1969*
B.S., B.E.E., E.E., D.Sc., (hon.), Ohio State University.
- PUNKE, HAROLD H. *Professor Emeritus, Foundations of Education, June, 1971*
B.S., M.S., University of Illinois; Ph.D., University of Chicago.
- RASH, JOE M. *Associate Professor Emeritus, Pharmacy, January, 1975*
B.M.E., M.D., Auburn University; Ph.D., University of Illinois.
- RICHARDSON, JESSE M. *Professor Emeritus, Economics and Geography, August, 1973*
B.A., M.A., University of Alabama; Ph.D., Peabody College.
- RITCHIE, VIRGINIA CORBIN *Associate Professor Emeritus, Home Economics, June, 1966*
B.S., M.S., University of Kentucky.
- ROBINSON, A. JUDE *Associate Professor Emeritus, Mathematics, June, 1967*
B.S., Clemson University; M.A., Emory University.
- ROY, KENNETH B. *Editor Emeritus, Department, Publications, July, 1961*
B.J., University of Missouri.
- SAHAG, L. M. *Professor Emeritus, Engineering Graphics, March, 1961*
B.S., University of North Carolina; M.S., Auburn University.
- SAUNDERS, CHARLES RICHARD *Dean Emeritus, School of Chemistry, July, 1969*
B.S., M.S., Auburn University; Ph.D., University of Nebraska.
- SCHELL, FRED G. *Professor Emeritus, Large Animal Surgery
and Medicine, February, 1974*
D.V.M., Auburn University.
- SMITH, E. V. *Dean Emeritus, the School of Agriculture and Director
Emeritus of the Agricultural Experiment Station, June, 1972*
B.S., Auburn University; M.S., Ph.D., Iowa State University.
- SPANN, RANSOM D. *Professor Emeritus, Electrical Engineering, June, 1964*
B.S.E.E., E.E., Auburn University.
- SPENCER, LILLY HESTER *Associate Professor Emeritus, Consumer Affairs, June, 1971*
B.S., M.S., Oklahoma State University.
- SPILE, MARION WALKER *Dean Emeritus, School of Home Economics, June, 1966*
B.S., Alabama College; B.S., M.A., Columbia University.
- STALNAKER, CARROLL C. *Associate Professor Emeritus,
Accounting and Finance, September, 1973*
B.A., State College of Iowa; M.A., University of Iowa.
- STURKIE, D. G. *Professor Emeritus, Agronomy and Soils, July, 1968*
B.S., Auburn University; M.S., Iowa State University; Ph.D., Michigan State University.
- TURNER, LOUISE K. *Associate Professor Emerita, Health, Physical
Education and Recreation, September, 1975*
B.A., Southwestern Louisiana University; M.A., M.S., Louisiana State University; Ph.D., New York University.
- TURNER, DEWEY M. *Associate Professor Emeritus, Animal and
Dairy Sciences, December, 1972*
B.S., Auburn University; M.S., University of Illinois.
- UMBACH, A. W. *Professor and Wrestling Coach Emeritus, August, 1973*
B.S., Southwestern State Teachers College; M.A., Colorado State College of Education.
- VAN DE MARK, MILDRED S. *Professor Emeritus, Home Economics, March, 1973*
B.S., Auburn University; M.S., Columbia University.
- WARD, BENJAMIN P. *Associate Professor Emeritus, Mechanical
Engineering, July, 1968*
B.S., U.S. Naval Academy; M.S.M.E., Columbia University.
- WARE, LAMAR MIMS *Professor Emeritus, Horticulture, June, 1966*
B.S., M.S., Auburn University.
- WHITE, RAYMOND H. *Professor Emeritus, Education, April, 1965*
B.S., Southwest Missouri State College; A.B., Drury College; A.M., University of Chicago; Ed.D., Columbia University.
- WINGARD, ROBERT EUGENE *Professor Emeritus, Chemical Engineering, October, 1974*
B.S., M.S., Auburn University.

STATE REGULATORY AND VETERINARY SERVICES

STATE REGULATORY SERVICE

CHEMISTRY

GUTHERY, MILFORD DALTON	.....	Director, 1966, 1972
B.S., M.S., Auburn University.		
RHOADES, REGINA A.	.....	Agricultural Chemist II, 1961, 1967
B.S., Auburn University.		
HAYES, MELVIN	.....	Agricultural Chemist II, 1966, 1968
B.S., University of West Virginia.		
HAYES, ROSE MAE	.....	Agricultural Chemist II, 1967, 1973
B.S., Florence State University.		
OWEN, MARJORIE E.	.....	Agricultural Chemist I, 1972
B.S., Florence State University.		
JINKS, JOHN D.	.....	Chemist II, 1968
B.S., Auburn University.		
BOULWARE, PAUL	.....	Chemist I, 1970
B.S., M.S., Auburn University.		
AYCOCK, BOBBY W.	.....	Assistant Chemist, 1975
B.S., Auburn University.		

STATE VETERINARY DIAGNOSTIC LABORATORY

(Conducted in cooperation with the Alabama State Department of Agriculture and Industries and the United States Department of Agriculture, Agricultural Research Service.)

GREENE, JAMES E.	Dean (School of Veterinary Medicine), 1937, 1958
D.V.M., M.S., Auburn University.		
MILLIGAN, JOHN G.	State Veterinarian, 1951
B.S., D.V.M., Auburn University.		
TAYLOR, JULIAN B.	Associate State Veterinarian, 1945
D.V.M., Auburn University.		
ROBERTS, CHARLES S.	Director (State Diagnostic Laboratory), 1947, 1963
D.V.M., Auburn University; M.S., Michigan State University.		
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- SELLMAN, L. R. *Research Associate, 1972*
B.S., Auburn University.
- SOUTH, DAVID *Research Associate, 1975*
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- WEINGARTNER, DAVID *Research Associate, 1974*
B.S., M.S., West Virginia University.
- BOYER, WILLIAM D. *Research Forester (Coop. USDA), 1975*
B.S., M.S., Merchant Marine Academy; B.S., M.S., Syracuse University; Ph.D., Duke University.

Home Economics Research

- GALBRAITH, RUTH LEGG *Head of Department and Dean,
School of Home Economics, 1970, 1973*
B.S., Ph.D., Purdue University.
- STOWE, BARBARA S. *Associate Professor, 1973*
B.S., University of Nebraska; M.S., Michigan State University; Ph.D., University of North Carolina.
- WASLIEN, CAROL I. *Associate Professor, 1973*
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- DEBES, SUE ANN *Assistant Professor, 1975*
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- HARDIN, IAN *Assistant Professor, 1971*
B.S., Auburn University; M.S., Institute of Textile Technology; Ph.D., Clemson University.
- SVACHA, ANNA J. *Assistant Professor, 1972*
B.S., Virginia Polytechnic Institute; M.S., Ph.D., University of Arizona.
- LISANO, LINDA CARMELLA *Research Associate, 1973*
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Horticulture

- PERKINS, DONALD Y. *Professor and Head of Department, 1966*
B.S., M.S., Louisiana State University; Ph.D., Cornell University.
- AMLING, HARRY J. *Professor, 1958, 1968*
B.S., Rutgers University; M.S., University of Delaware; Ph.D., Michigan State University.
- GREENLEAF, W. H. *Professor, 1947, 1962*
B.S., Ph.D., University of California at Berkeley.
- NORTON, JOSEPH D. *Professor, 1960, 1973*
B.S., M.S., Auburn University; Ph.D., Louisiana State University.
- ORR, HENRY P. *Professor, 1947, 1962*
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B.S., M.S., Auburn University; Ph.D., Purdue University.
- HARRIS, HUBERT *Associate Professor, 1936, 1948*
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- PERRY, FREDERICK B., JR. *Associate Professor, 1957, 1971*
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- DOZIER, W. ALFRED, JR. *Assistant Professor, 1965, 1971*
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- RYMAL, KENNETH S. *Assistant Professor, 1966*
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- MARCUS, KAREN A. *Research Associate, 1968*
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- MARTIN, W. C., JR. *Research Associate, 1951, 1958*
B.S., Auburn University.
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B.S., M.S., Auburn University.
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Poultry Science

- MOORE, CLAUDE H. *Professor and Head of Department, 1956, 1959*
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- COTTIER, G. J. *Professor, 1930, 1949*
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- MORA, E. C. *Professor, 1958, 1967*
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- BREWER, ROBERT N. *Associate Professor, 1968, 1974*
B.S., M.S., Auburn University; Ph.D., University of Georgia.
- JOHNSON, L. W. *Associate Professor, 1955*
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- MCDANIEL, GAYNER R. *Associate Professor, 1968*
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- ROLAND, DAVID A. *Associate Professor, 1976*
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Research Data Analysis

- PATTERSON, R. M. *Professor, 1949, 1968*
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- WILLIAMS, JOHN C., JR. *Associate Professor, 1970*
B.S., M.S., North Carolina State University; Ph.D., Iowa State University.
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Research Information

- WHITE, J. HERBERT *Director, University Relations, 1960, 1965*
B.S., Auburn University.
- MCGRAW, E. L. *Editor and Head of Department, 1941, 1968*
B.S., M.S., Auburn University.
- STEVENSON, R. E. *Associate Editor, 1955, 1960*
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- ROBERSON, JAMES ROY *Assistant Editor, 1973*
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Research Operations

- BROWN, V. LAVERN *Head and Head of Department, 1949, 1974*
B.S., Mississippi State University.
- MCINNIS, JAMES A. *Superintendent, 1975*
B.S., Auburn University.

Zoology-Entomology

- HAYS, KIRBY LEE *Professor and Head of Department, 1957, 1975*
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- BASS, MAX H. *Professor, 1959, 1969*
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- BERGER, ROBERT S. *Professor, 1963, 1969*
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- DENDY, JOHN STILES *Professor, 1947, 1957*
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- CUNNINGHAM, HUGH B. *Associate Professor, 1951, 1965*
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- GILLILAND, FLOYD R. *Associate Professor, 1967, 1971*
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- HARPER, JAMES D. *Associate Professor, 1969, 1975*
B.S., M.S., University of Illinois; Ph.D., Oregon State University.
- HYCHE, LACY L. *Associate Professor, 1952, 1960*
B.S., M.S., Auburn University.
- KOUSKOLEKAS, COSTAS A. *Associate Professor, 1967, 1973*
B.S., University of The Saloniki; M.S., University of Missouri; Ph.D., University of Illinois.
- RAMSEY, JOHN S. *Associate Professor, 1967, 1970*
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- SPEAKE, DAN W. *Associate Professor, 1955, 1970*
B.S., M.S., Ph.D., Auburn University.
- CAUSEY, M. KEITH *Assistant Professor, 1968*
B.S., M.S., Ph.D., Louisiana State University.
- ESTES, PAUL M. *Assistant Professor, 1966*
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- HILL, EDWARD P., III *Assistant Professor, 1967, 1974*
B.S., Oregon State University; M.S., Ph.D., Auburn University.
- KENNAMER, JAMES E. *Assistant Professor, 1970*
B.S., Auburn University; M.S., Ph.D., Mississippi State University.
- LISANO, M.E. *Assistant Professor, 1970, 1974*
B.S., M.S., Sam Houston State; Ph.D., Texas A&M University.
- MULLEN, GARY R. *Assistant Professor, 1975*
B.A., Northeastern University; Ph.D., Cornell University.
- DAVIS, R. L. *Research Associate, 1974*
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SUBSTATIONS AND FIELDS

Black Belt—Marion Junction, Dallas County

- SMITH, L. A. *Superintendent, 1951, 1957*
B.S., Auburn University.
- GRIMES, HAROLD W., JR. *Assistant Superintendent, 1955, 1957*
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- HOLLIMAN, JAMES LOUIS *Assistant Superintendent, 1975*
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Chilton Area Horticulture—Clanton, Chilton County

- CARLTON, C. C. Superintendent, 1948
B.S., Auburn University.
- SHORT, KENNETH C. Assistant Superintendent, 1960
B.S., Auburn University.

Gulf Coast—Fairhope, Baldwin County

- BARRETT, J. E., JR. Superintendent, 1948, 1973
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- MCDANIEL, N. R. Assistant Superintendent, 1969
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Lower Coastal Plain—Camden, Wilcox County

- LITTLE, JOE A. Superintendent, 1959, 1975
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- CHITTENDEN, L. W. Assistant Superintendent, 1974
B.S., M.S., University of Kentucky.
- OWEN, JOHN T., III Assistant Superintendent, 1974, 1975
B.S., Auburn University.
- WATSON, W. J. Assistant Superintendent, 1958
B.S., Auburn University.

North Alabama Horticulture—Cullman, Cullman County

- HOLLINGSWORTH, M. H. Superintendent, 1958, 1962
B.S., Auburn University.

Piedmont—Camp Hill, Tallapoosa County

- GRIFFEY, W. A. Superintendent, 1972, 1973
B.S., M.S., University of Tennessee.
- BURGESS, HOYT E. Assistant Superintendent, 1967, 1973
B.S., Auburn University.

Sand Mountain—Crossville, DeKalb County

- EASON, J. T. Superintendent, 1966, 1974
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Tennessee Valley—Belle Mina, Limestone County

- BOSECK, J. K. Superintendent, 1937, 1954
B.S., Auburn University.
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Upper Coastal Plain—Winfield, Fayette & Marion Counties

- MOORE, ROBERT A., JR. Superintendent, 1959, 1969
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Wiregrass—Headland, Henry County

- STARLING, J. G. Superintendent, 1948, 1972
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- IVEY, HENRY W. Assistant Superintendent, 1960, 1966
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Ornamental Horticulture Field Station—Spring Hill, Mobile County

SELF, R. L. *Plant Pathologist, 1942, 1952*
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Brewton & Monroeville Fields—Escambia & Monroe Counties

CARDEN, EMMETT *Superintendent (Brewton), 1969*
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Prattville & Tuskegee Fields—Autauga & Macon Counties

GLAZE, FRED T. *Superintendent (Prattville), 1954, 1969*
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COOPERATIVE EXTENSION SERVICE STAFF

HARRY M. PHILPOTT, A.B., Ph.D., D.D. LL.D., *President*

- BRAMLETT, GENE A. *Vice President for Extension and Public Service, 1975*
B.S., Murray State University; M.S., Ph.D., University of Kentucky.
- SPROTT, J. MICHAEL *Director, 1975*
B.S., M.S., University of Arkansas; Ph.D., Texas A & M University
- CAVENDER, A. R. *Associate Director-Programs, 1958, 1975*
B.S., M.S., University of Tennessee; Ph.D., University of Wisconsin.
- TAYLOR, W. H. *Associate Director-Field Operations, 1948, 1975*
B.S., Auburn University; M.S., Ed.D., Cornell University.
- BUFORD, JAMES A. JR. *Director of Personnel, 1965, 1971*
B.S.F., M.S., Auburn University; Ph.D., University of Georgia.
- HORN, ROBERT C. *Head, Management Service, 1944, 1969*
B.S., Auburn University; M.S., University of Wisconsin.
- SHERER, RALPH L. *Coordinator (Continuing Education), 1955, 1969*
B.S., Auburn University; M.S., Cornell University.
- SMITH, JAMES L. *Head, Staff Development, 1965, 1975*
B.S., Edward Waters College; M.S., Tuskegee Institute; Ph.D., Ohio State University.
- STRICKLAND, ELMER OSCAR *Assistant to the Director, 1961, 1972*
B.S., M.Ag.Ed., Auburn University; Ed.D., Louisiana State University.
- TATE, DOROTHY E. *Assistant Director, Home Economics, 1976*
B.S., M.S., Pennsylvania State University; Ed.D., North Carolina State University.
- WHITE, J. HERBERT *Director (University Relations), 1960, 1965*
B.S., Auburn University
- WHITE, LOUIS E. *Conference Director, 1962, 1969*
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Supervisors

- BULLINGTON, JOHN C. *District Extension Chairman, 1939, 1965*
B.S., Auburn University.
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- SOWELL, WALTER F. *District Extension Chairman, 1948, 1974*
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- HULSEY, MARY *Associate District Extension Chairman, 1941, 1965*
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- MALLETTE, LUCILE *Associate District Extension Chairman, 1936, 1965*
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- WALKER, CLEO S. *Associate District Extension Chairman, 1958, 1971*
B.S., M.S., Tuskegee Institute.

Division Chairmen

- HAGLER, THOMAS BENJAMIN *Chairman (Plant Science Division), 1960*
B.S., M.S., Auburn University; Ph.D., University of Maryland.
- LANIER, WORTH *Chairman (Environmental Health Division), 1960, 1969*
B.S., Mississippi State University; D.V.M., Auburn University.
- MCGUIRE, ROBERT LEE *Chairman (Animal Science Division), 1974*
B.S., M.S., North Carolina State; Ph.D., University of Kentucky.
- PARROTT, JOHN *Chairman (Extension Information), 1941, 1969*
B.S., M.Ed., Auburn University.

On-Campus Specialists

- ALLEY, J. LEE *Extension Veterinarian, 1969*
B.S., Auburn University; D.V.M., Auburn University.
- AYCOCK, GEORGIA LOU *Specialist (Home Furnishings), 1974*
B.S., M.Ed., Auburn University.
- BALCH, G. TALMADGE *Specialist in Pesticide Education, 1957, 1965*
B.S., M.Ag., Auburn University; LL.B. of Law, Jones Law School.
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- BOND, M. D. *Peanut Specialist*, 1955, 1969
B.S., M.Ag.Ed., Auburn University.
- BROWN, ALEX C. *Specialist 4-H Visuals*, 1959, 1972
B.S., Tuskegee Institute; M.S., Indiana University.
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B.S., M.Ag.Ec., Auburn University.
- BURDETT, ROBERT A. *Agronomist (Seed)*, 1968
B.S., M.S., Auburn University.
- BUSHONG, REX DEAN *Extension Poultryman*, 1975
B.S., M.S., Ph.D., Mississippi State University.
- CHAPMAN, LOUIE J. *Specialist (Agronomy)*, 1967
B.S., M.S., Auburn University; Ph.D., University of Florida.
- CHENEY, WALTER K. *Art Editor*, 1958, 1962
B.A.A., Auburn University.
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B.S., M.S., Auburn University.
- COPELAND, KENNETH J. *News Editor*, 1957, 1960
B.S., M.Ag.Ed., Auburn University.
- CURTIS, WILLIAM W., JR. *District Program Specialist*, 1963, 1973
B.S., M.Agr., Auburn University.
- DANION, JAMES RICHARD *Animal Husbandman*, 1960, 1965
B.S., M.S., University of Georgia; Ph.D., Auburn University.
- DEESE, RICHARD E. *Animal Husbandman*, 1965
B.S., M.S., Mississippi State University; Ph.D., University of Florida.
- DENNIS, CARL *Apiculturist*, 1954, 1968
B.S., M.Ag., Auburn University.
- DOWNY, ISABELLE *Specialist (Food Preservation)*, 1944, 1958
B.S., Auburn University; M.S., University of Georgia.
- DOZIER, LESEL A. *Specialist Community Development-4-H*, 1964, 1973
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B.S., Centenary College; M.S., Ph.D., Louisiana State University.
- GARDNER, DANIEL T. *Wildlife Specialist*, 1975
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- GLASSCOCK, M. R. *Economist (Fruits and Vegetable Marketing)*, 1941, 1962
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B.S., M.S., Auburn University; Ph.D., North Carolina State University.
- HIGH, THOMAS W., JR. *Extension Animal Husbandman*, 1966
B.S., University of Florida; M.S., Ph.D., University of Tennessee.
- HOLLEY, BETTY B. *Specialist (Educational Methods)*, 1969
B.S., University of Tennessee; M.S., University of Alabama.
- HOLMES, JULIAN *Economist-Farm Management*, 1971
B.S., M.S., Auburn University; Ph.D., University of Tennessee.
- HUDDLESTON, NORMAN R. *Economist*, 1968
B.S., Tennessee Technological University; M.S., University of Tennessee; Ph.D., Mississippi State University.
- JONES, BERTHA MAE *4-H Club Specialist*, 1945, 1965
B.S., Alabama A & M University; M.Ed., Pennsylvania State University.
- JONES, WILLIAM R. *Food Scientist*, 1975
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- LEDBETTER, ROY J. *Entomologist*, 1954, 1962
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- LEE, VERRON WILSON *Economist (Poultry Marketing)*, 1965, 1967
B.S., Auburn University; M.S., University of Arizona.
- LINTON, DANIEL A., JR. *Economist (Livestock Marketing)*, 1962
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- LITTLE, ROBERT L. *Specialist (Forest Products Marketing & Utilization)*, 1971
B.S., M.S., Clemson University.
- LOVELL, GANATA JO *Specialist in Educational Methods*, 1972
B.S., Northwestern State; M.S., Louisiana State University.
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- MAYFIELD, WILLIAM D. Extension Agricultural Engineer, 1971
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- MCCORD, WARREN Specialist in Community & Regional Development, 1972
B.S., University of North Alabama; M.S., Ph.D., Auburn University.
- McKOWN, ANNA LOUISE Health Education Specialist, 1973
B.S., Phillips University; M.S., Yale University.
- McQUEEN, HOUSTON FRANK Survey Entomologist, 1963
B.S., Auburn University.
- OGBURN, CHARLES B. Agricultural Engineer, 1968
B.S., M.S., Virginia Polytechnic Institute.
- OVERBEY, DOROTHY Specialist (Consumer Education), 1943, 1949
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- PRICKETT, FARISS Specialist in Foods and Nutrition, 1955, 1970
B.S., M.S., Auburn University.
- RUFFIN, BURLSON GWENETTE .. Extension Animal Husbandman-Beef Nutritionist, 1972
B.S., M.S., Mississippi State University; Ph.D., Auburn University.
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B.S., M.Ag.Ed., Auburn University; Ph.D., Michigan State University.
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B.A., Auburn University; M.A., University of Alabama.
- SMITH, PERRY M. Extension Horticulture-Vegetables, 1966, 1969
B.S., Clemson University; M.S., North Carolina State University.
- SMITH, RONALD H. Entomologist-Cotton, 1972
B.S., M.S., Ph.D., Auburn University.
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B.S., M.S., Auburn University.
- STRAIN, WILLIE LEE News Editor, 1955, 1965
B.S., M.Ed., Tuskegee Institute.
- STRAWN, HARRY Economist-Resource Development, 1969
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- STROTHER, GENE R. Extension Entomologist, 1973
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- THORNTON, NANCY H. Publications Editor, 1970, 1972
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- WADE, LARKIN H. Extension Forester, 1965
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- WATSON, SARAH N. Specialist in Educational Methods, 1961, 1971
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- WEEKS, JOHN PETER Fisheries Specialist, 1970
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B.S., University of Montevallo; M.S., University of Tennessee.
- WHITTENBURG, BOBBY LEROY 4-H Livestock Specialist, 1965
B.S., M.S., University of Tennessee.
- WILLIAMS, GERTHEN E., Visual Editor, 1960, 1967
B.S., M.Ed., Auburn University.
- YERBY, LLOYD B. Radio and T.V. Editor, 1974
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Off-Campus Specialists

- EICH, SAMUEL M. Area Cotton Specialist, 1957, 1968
B.S., M.Ag., Auburn University.

- GIVHAN, JOE *Rural Resource Development Specialist*, 1935, 1963
B.S., Auburn University.
- GOODSON, LINDA W. *Health Education Specialist*, 1973
R.N., University of Alabama.
- JONES, ROBERT F. *Resource Management Specialist*, 1949, 1969
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- KIRBY, KATHY *Health Education Specialist*, 1973
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- LINK, J. G. *Agronomist*, TVA, 1959, 1963
B.S., M.S., Auburn University.
- MARKS, H. HERMAN *District Program Specialist*, 1954, 1963
B.S., M.Ag.Ed., Auburn University.
- MCDANIEL, CLARENCE H. *Resource Management Specialist*, 1952, 1969
B.S., M.S., Alabama A & M University.
- PARKER, CARL *Rural Resource Development Specialist*, 1944, 1961
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- ROBERTS, LARRY W. *Economist-Farm Management*, 1960, 1968
B.S., M.S., Auburn University.
- SEGREST, CHARLES *Rural Resource Development Specialist*, 1956, 1962
B.S., M.Ag.Ed., Auburn University.
- STOREY, C. U. *Rural Resource Development Specialist*, 1965
B.S., Auburn University. M.Ag., University of Florida.
- THOMAS, CHARLES F. *Specialist (Poultry)*, 1958, 1966
B.S., M.S., Auburn University.
- TIDWELL, MACON B. *Rural Resource Development Specialist*, 1957, 1961
B.S., M.Ag., Auburn University.
- WILLIAMS, W. R. *Economist-Farm Management*, 1946, 1969
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- WILSON, WILLIAM E. *Rural Resource Development Specialist*, 1954, 1961
B.S., M.Ag., Auburn University.
- YELDER, NELLIE A. *Health Education Specialist*, 1973
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Other Staff

- BROWN, GRACE F. *Administrative Assistant*, 1958, 1966
- GOLDEN, MILDRED *Administrative Assistant*, 1969, 1972
- GOOD, MYRTLE *Administrative Assistant*, 1929, 1966

County Staffs

(List for each county as follows: County Address, county extension chairman, extension farm agent; associate county extension chairman, extension home agent; first appointment, present appointment. All degrees are from Auburn University unless otherwise indicated.)

- AUTAUGA R. H. Kirkpatrick, B.S., M.Ed.; 1944, 1965; Jerry A. Green, B.S.,
Prattville Tuskegee Institute, 1954, 1965; Max F. Scott, B.S., M.Ag., 1962, 1965.
Louvenia A. Lee, B.S., Tuskegee Institute, 1955, 1972.
- BALDWIN Donald Eugene Dunn, B.S., 1962, 1965; Edward J.
Bay Minette Coats, B.S., Western Kentucky State University; M.S., 1966. Lyndell
Edward Tunnell, B.S., M.Ed. 1973; Eugenia Small, B.S., 1937, 1974;
Rhonda Kay Davis, B.S., 1975; Grace Kirkman, B.S., University of
Alabama, 1975.
- BARBOUR J.W. Walton, B.S., 1946, 1965; William H. Lindsey, B.S., Tuskegee
Clayton Institute, 1966.
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Hunter, B.S., University of N. Alabama, 1974.
- BIBB Loyd P. Owens, B.S., M.Ag., 1954, 1971; T. W. Camp, B.S., 1951,
Centerville 1965. Faye B. Smith, B.S., University of Alabama, 1964, 1971; Mattie
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BLOUNT Oneonta	D.S. Loyd, B.S., M.Ag., 1942, 1965; James O. Conway, B.S., M.Ed. 1967; L. C. McCall, B.S., 1955, 1965. Mildred Gilbert, B.S., M. of H.Ec., 1944, 1965; Brenda L. Hale, B.S., Alabama A&M, 1974.
BULLOCK Union Springs	W. E. Stone, B.S., M.Ag., 1947, 1965; Armstead Young, B.S., M.S., Tuskegee Institute, 1973. Nannie S. Rhodes, B.S., Southern University, 1959, 1965.
BUTLER Greenville	F. H. Morgan, B.S., M.Ag., 1946, 1965; J. P. Moore, B.S., M.Ag., 1953, 1965; Jacob H. Ross, B.S., Tuskegee Institute, M.A., Michigan State University, 1950, 1965; R.C. Thompson, B.S., 1954, 1965. Laurine Howell, B.S., University of Alabama, 1949, 1965; Wilma Jean Womack, B.S., Alabama A&M, 1973.
CALHOUN Anniston	A.S. Mathews, B.S., 1941, 1965; Goode Nelson, B.A., University of Alabama, 1945, 1965; John D. Sellers, B.S., 1949, 1966; Bobby Freeman, B.S., 1975. Barbara W. Mobley, B.A., M.A., University of Mississippi, 1966, 1970; Mazie Howard Wilson, B.S., Alabama A&M University, 1972; Breta M. Arrington, Tuskegee Institute, 1974; Brenda Jones, B.S., Jacksonville State University, 1971, 1974.
CHAMBERS LaFayette	Howard A. Taylor, B.S., M.Ag.Ed., 1962, 1967; Willie Lawson, B.S., Alabama A&M University, M.Ed., Tuskegee Institute, 1947, 1965; Hubert R. Armstrong B.S., 1974. Exa Till, B.S., 1946, 1965; Mary Frances Griggs, B.S., Alabama A&M University, 1952, 1965; Ivy Jackson, B.S., 1975.
CHEROKEE Centre	Howard D. Hall, B.S., M.Ag., 1962, 1970; J. B. Butler, B.S., 1954, 1967; Charles R. Moody, B.S., 1964, 1965. Geneva Marshall James, B.S., 1941, 1965; Irene J. Lackey, B.S., 1965, 1967.
CHILTON Clanton	W. R. Futral, B.S., M.Ag., 1959, 1965; Tommy J. Brown, B.S., 1971, 1972; D. R. Mims, B.S., 1953, 1965. Mrs. Johnnie Lane, A.B., Judson College, 1952, 1965; Sarah Hickman McDowell, B.S., University of Montevallo, 1967.
CHOCTAW Butler	Mathew Sexton, B.S., 1937, 1965; Joseph T. Banks, B.S., M.Ed., Tuskegee Institute, 1947, 1965; R. B. Deavours, B.S.; M.S., Mississippi State University, 1946, 1965. Grace M. Prince, B.S., 1951, 1965; Dale B. Glass, B.S., University of Alabama; M.S., Livingston University, 1967; Gladys A. Horn, B.S., Tuskegee Institute, 1950, 1965.
CLARKE Grove Hill	Fred W. Kilgore, B.S., M.S., Mississippi State University, 1954, 1973; Thomas J. Breland, B.S., M.Ed., Tuskegee Institute, 1972; Sara G. Alexander, B.S., Mississippi State College for Women, 1967; Joe Ann Arthur, B.S., University of Southern Mississippi, 1967.
CLAY Ashland	George A. Peasant, B.S., Tuskegee Institute; M.S. Virginia State College, 1960, 1972; Tom F. Farrow, B.S., 1970. Dora-grace Smith, B.S., University of Montevallo, 1952, 1965; Ann S. McEwen, B.S., University of Montevallo, 1975.
CLEBURNE Heflin	W. J. Thompson, B.S., M.S., Ed., 1954, 1971; E. C. Farrington, B.S., 1941, 1965; Judith Brown, B.S., 1970; Marjorie J. Sellers, B.S., 1972.
COFFEE Enterprise	T. C. Casaday, B.S., M.Ag., 1949, 1965; Dan J. Presley, B.S., M.Ag., 1964, 1966; J. R. Speed, 1943, 1965. Sarah Hutchinson, B.S., Howard College, M.S., 1956, 1965; Sandra T. Coffey, B.S., University of Tennessee, 1972; Sadie K. Petty, B.S., Alabama A&M., M.S., Tuskegee Institute, 1973.

COLBERT Tuscumbia	Harold Eugene Rose, B.S., M.Ext. Ed., Mississippi State University 1961; Danny Joe Potter, B.S., 1973. Charles E. Andrews, B.S., Tuskegee Institute, 1973. Christa Hall, B.S., University of Alabama, 1950, 1965.
CONECUH Evergreen	M. H. Huggins, B.S., 1936, 1965; H. J. Oakley, B.S., 1954, 1965; Stephen M. Harris, B.S., Tuskegee Institute, M.Ed. Alabama State University; Louise T. Ostrom, B.S., M.Ed., 1957, 1965; Hazel H. Harpe, B.A., Judson College, 1961, 1965.
COOSA Rockford	G.S. Sessions, B.S., M.Ag.Ed., 1955, 1965; Elmer Dowdell, B.S., Alcorn A&M College; M.S., Tuskegee Institute, 1957, 1965. Mariah B. Brymer, B.S., M.Ed., Tuskegee Institute, 1963, 1965; Thelma D. Davis, B.S., 1970.
COVINGTON Andalusia	W. H. Kinard, B.S., M.Ag., 1954, 1965; Robert E. Linder, B.S., M.Ag., 1960, 1965; C. W. Pike, B.S., M.Ag., 1952, 1965. Donald Lester, B.S., 1973; Mary Ellen Haynes, B.S., University of Montevallo, 1951, 1965; Ann T. Martin, B.S., University of Alabama, 1966.
CRENSHAW Luverne	Ted B. Smith, B.S., M.S., Troy State University, 1963, 1969; G. B. Handley, B.S., 1948, 1965. Eunice Prater King, B.S., University of Montevallo, 1953, 1965; Eunice Tibbs, B.S., Ala. A&M., 1973.
CULLMAN Cullman	Bob Eugene Spears, B.S., Oklahoma State University; M.S., University of Tennessee, 1964, 1971; Billy Ray Baswell, B.S., 1966, 1968; William Cofield, B.S., 1975; M.T. Whisenant, B.S., 1949, 1965; Mary Sue Tillery, B.S., M.S., 1947, 1965; Peggy M. Harris, B.S., University of Montevallo, 1964.
DALE Ozark	T. G. Hubbard, B.S., M.Ag., 1936, 1970; James H. Estes, B.S., M.Ag., 1963, 1965; Ida Jo Harrison, B.S., U. of Montevallo; M.Ed., University of Tennessee, 1970, 1973; Patsy M. White, B.S., M.S., Troy State University, 1970.
DALLAS Selma	L. C. Alsobrook, B.S., 1942, 1965; James S. Hines, B.S., M.Ed., 1966; George C. Hoomes, B.S., M.S., 1963, 1967; Charles D. Scott, II, B.S., M.Ed., Tuskegee Institute, 1951, 1965. Norma M. McCrory, B.S., University of Southern Mississippi, 1961, 1971; Harriet R. Bates, B.S., M.Ed., Alabama State University, 1974.
DeKALB Ft. Payne	F. DeWitt Robinson, B.S., 1949, 1965; D. C. Poe, B.S., 1956, 1965 Jeffrey Clary, B.S., 1973; Terry L. Shackelford, B.S., Alabama A&M, 1974; Mary Louise Walker, B.S., Peabody College, 1954, 1965; Rebecca M. Dollman, B.S., 1974.
ELMORE Wetumpka	Jack Thompson, B.S., M.S., University of Tennessee; Wayne E. Davis, B.S., M.S., 1959, 1965; George W. Jackson, B.S., M.S., Tuskegee Institute, 1966, 1972; Barbara M. Marcelius, B.S., M.S., University of Alabama; Gwendolyn E. Turner, B.S., Alabama A&M University, 1968; Marilee Tankersley, B.S., 1975.
ESCAMBIA Brewton	R. J. Martin, B.S., 1946, 1966; Edward M. Knowles, B.S., M.Ag., 1953, 1965; Barry E. Wood, B.S., 1966, 1967. Peggy Bracken, B.S., 1963, 1965; Carolyn F. Bivins, B.S., Tuskegee Institute, 1974.
ETOWAH Gadsden	T. L. Sanderson, B.S., M.S., 1943, 1965; H. J. Jackson, B.S., University of Georgia, 1944, 1965; Sara L. Thomas, B.S., 1947, 1965; Maude V. Hill, B.S., Alabama A&M, 1971; Celeste H. Martin, B.S., M.A., 1957, 1965; Elouise O. Turk, B.S., Alabama A&M University; M.A.T., Indiana University.

FAYETTE Fayette	James Pettus Tucker, B.S., M.Ag., 1961, 1970; Samuel Fowler, B.S., Mississippi State University, 1973; Annie Mary Hester, B.S., Berry College; M.S., University of Alabama, 1953, 1965; Mary Joyce McReynolds, B.S., Alcorn State University, 1974.
FRANKLIN Russellville	Waymon Ray Pace, B.S., 1972; R. Gregg Hodges, B.S., Mississippi State University, 1975. Joyce McNutt, B.S., 1954, 1965; Karen H. Thompson, B.S., University of Montevallo, 1974.
GENEVA Geneva	R. C. Reynolds, B.S., M.Ag.Ed., 1954, 1965; Dan A. Gary, B.S., 1969, David Carpenter, B.S., 1975. Emily H. Seay, B.S., University of Montevallo, 1960, 1965; Wanda G. Creel, B.S., 1973.
GREENE Eutaw	Charles S. Foreman, B.S., M.Ed., Tuskegee Institute, 1945, 1972; Jerry B. Clark, B.S., M.Ed., 1965, 1972; Evelyn Blackmon, B.S., Alabama A&M University, 1965, 1971; Betty Sue Young, B.S., M.S., Tuskegee Institute, 1972.
HALE Greensboro	J. B. Deavours, B.S., 1937, 1965; Gwinn Russell Ezell, B.S., Alabama A&M University, 1962, 1965; J. N. Glass, B.S., M.Ag., 1948, 1965. Evelyn D. Edwards, B.S., M.S., University of Alabama, 1966; Katie I. Carlton, B.S., Tuskegee Institute, 1950, 1965; Marie P. Dombhart, B.S., 1959, 1975.
HENRY Abbeville	R. C. Hartzog, B.S., 1946; C. L. Barefield, B.S., 1951, 1965; David Lee Daniel, B.S., Alabama A&M University, 1972. Margaret O. Eason Kirkland, B.S., M. H.Ed., Jacksonville State University, 1961, 1965; Rassie T. Farmer, B.S., Langston University, 1967; Jewel W. Hardwick, B.S., 1958, 1967.
HOUSTON Dothan	Allen M. Mathews, B.S., M.Ag., 1957, 1965; Marion H. Roney, B.S., 1962, 1965; Reafield Vester, B.S., Alabama A&M University, M.S., University of Florida, 1966; Michael A. Davis, B.S., 1974; James M. Clary, B.S., 1974. J. Ronald Weeks, B.S., 1975; Julia Smith, B.S., 1955, 1965; Mildred Mae Ward, M.S., Alabama A&M University; M.Ed., Tuskegee Institute, 1955, 1965; Claudia W. Meadows, B.S., 1971.
JACKSON Scottsboro	B. T. Richardson, B. S., 1945, 1968; James H. Pitts, B.S., M.S., Mississippi State University, 1955, 1969; James A. Sharp, B.S., 1973. Mrs. Clyde Peck, B.S., 1942, 1965; Betty D. Moore, B.S., 1963, 1969.
JEFFERSON Birmingham	C. H. Johns, B.S., 1937, 1965; Hiram N. McCall, B.S., 1970; Charles E. Smith, B.S., M.Ed., 1966, 1967; William Gaines Smith, B.S., M.Ag., 1965; Percy L. White, B.S., Alabama A&M University; M.Ed., Tuskegee Institute, 1949, 1965; David W. Bradford, B.S., 1969. Ruby J. Robinson, B.S., Philander Smith College, 1945, 1965; Helen T. Wilson, B.S., Alabama A&M University, 1970; Carrie Lena Smith, B.S., 1971; LaVurn Stinson, B.S., Alabama A&M, 1971, 1974.
LAMAR Vernon	H. H. Lumpkin, B.S., 1950, 1965; C. T. Guthrie, B.S., M.Ext.Edu. Mississippi State University, 1966. Barbara Alawine, B.S., M.A.Ed., University of Alabama, 1953, 1965; Janice Boykin Dowdle, B.S., Jacksonville State University, 1970.
LAUDERDALE Florence	Earl C. Halla, B.S., M.Agr. 1953, 1973; Charles W. Burns, B.S., M.Ag., 1957, 1965; Robert T. Hughes, B.S., Alabama A&M University; M.S., Tuskegee Institute, 1958, 1965; Ronald D. Lane, B.S., 1973, 1974. Sara F. Conner, B.S., University of Montevallo, 1949, 1965; Sadie L. McClellan, B.S., Tuskegee Institute, 1944, 1965; Sandra Harper, B.S., University of North Alabama, 1970, 1972.

- LAWRENCE**
Moulton S. P. McClendon, B.S., 1943, 1965; Henry J. Buchanan, B.S., Alabama A&M University, 1970; Dean Parris, B.S., M.Ag., 1959, 1965; James E. Pinion, B.S., M.Ed., 1966, 1970.
Ruby Rogers, B.S., Athens College, 1953, 1965; Martha H. Pool, B.S., Jacksonville State University, 1966, 1969; Inez M. Petty, B.S., Alabama A&M University; M.Ed., Tuskegee Institute, 1949, 1965.
- LEE**
Opelika R. W. Teague, B.S., 1948, 1965; Richard Dyar, B.S., 1971; Paul Henry Waddy, B.S., Alabama A&M University, M.Ag. Ed., Tuskegee Institute, 1964, 1965; Lawrence Hawsey, B.S., M.Ed., 1965, 1972.
Elisabeth Crum, B.S., 1955, 1965; Willie C. Lockhart, B.S., Tuskegee Institute, 1937, 1965; Susan B. Wetherington, B.S., University of Georgia, 1970.
- LIMESTONE**
Athens Daniel R. Salter, B.S., M.S., Tuskegee Institute, 1949, 1973; Watkins L. Carter, B.S., M.S., Mississippi State University, 1967; F. Macon Patterson, B.S., M.S., 1954, 1968.
Athelstine H. Malone, B.S., Alabama A&M University, 1956, 1973; Margie L. McCary, B.S., 1973.
- LOWNDES**
Hayneville Tom J. Gerald, B.S., M.Ag., 1946, 1969; Scott Billingsley, B.S., M.S., Tuskegee Institute, 1951, 1965; Clarence J. Maudlin, B.S., M.S., Tuskegee Institute, 1972; Carolyn L. Hicks, B.S., Tuskegee Institute, 1967, 1974.
Katie Welch Jackson, B.S., University of Alabama 1973.
- MACON**
Tuskegee J. M. Bolling, B.S., 1939, 1965; James Boyd, B.S., Alabama A&M University, 1971; Leonard Huffman, B.S., M.Ed., Tuskegee Institute, 1962, 1965.
Carolyn Brown Williams, B.S., Tuskegee Institute, 1962, 1968.
Annette B. Wallace, B.S., M.S., Alabama A&M University, 1966, 1971.
- MADISON**
Huntsville R. O. Magnusson, B.S., 1948, 1965; Robert Burton, B.S., Alabama A&M University, 1962, 1969; Bobby Lee Stewart, B.S., Alabama A&M University, 1972; Gary E. Murray, B.S., 1974; Larry Easterwood, B.S., M.Ag. Ed., 1961, 1974.
Christine Huber, B.S., Peabody College, 1944, 1965; Jackie Fay McDonald, B.S., Tennessee Tech. University, 1973; Jacquelyn B. Outlaw, B.S., Tuskegee Institute, 1968; Alyce B. Garland, B.S., Alabama A&M University, 1972; Victoria L. McInnish, B.S., University of Alabama, 1973.
- MARENGO**
Linden Cecil Miller, B.S., M.Ag., 1954, 1968; Rudy P. Yates, B.S., M.Ag., 1960; William Norwood, B.S., Alabama A&M University; M.Ed., Tuskegee Institute, 1973; Marjorie Weaver, B.S., 1943; 1965; Rosalyn Ketchum Palmer, B.S., 1960, 1965; Vera J. Wilson, B.S., Alabama A&M University, 1966.
- MARION**
Hamilton H. B. Price, B.S., 1945, 1965; Lathan D. Hooks, B.S., Grover C. Brooks, B.S., Alabama A&M University; M.S., Tennessee A&I, 1972.
Elna Tanner, B.S., M.S., University of Tennessee, 1950, 1965; Penelope F. Walton, B.S., M.S., University of Alabama, 1972.
- MARSHALL**
Guntersville W. L. Martin, B.S., 1942, 1965; Bobby E. Jones, B.S., 1973; Franklin H. Wood, B.S., M. Agr., 1963, 1974.
Maxine Johnson Crump, B.S., University of North Alabama, 1967, 1970; Joyce M. Morgan, B.S., University of North Alabama, 1970.
- MOBILE**
Mobile Charles B. Vickery, B.S., 1948, 1965; Charles H. Kilpatrick, B.S., M.A. University of South Alabama, 1964, 1965; Andrew D. Greer, B.S., 1973; Dennis Peterson, 1973, 1974.
Myra N. Barton, B.S., University of Montevallo, 1968; Sylvia G. Oakes, B.S., Alabama A&M University, 1972; Dian Grade, B.S., University of Alabama, 1975; Julia McCollum, B.S., North Carolina A&T University, 1975.

MONROE Monroeville	James H. Sellers, B.S., 1966. Mike M. Gamble, B.S., Mississippi State University, 1966; Rodie M. Ruffin, B.S., Tuskegee Institute, 1973. Annie Richardson, A.B., Judson College, M.S., Livingston State University, 1952, 1965; DeLois Carmichael, B.S., M.Ed., Tuskegee Institute, 1952, 1965; Annette J. Cave, B.S., University of Southern Mississippi, 1967.
MONTGOMERY Montgomery	T. P. McCabe, B.S., M.Ag., 1939, 1965; Leonard E. Brown, B.S., Alcorn A&M College; M.S., Tuskegee Institute, 1964, 1965; Addre Bryant, B.S., Tuskegee Institute, 1954, 1965; Sam E. Crouch, B.S., 1974; Bobby L. Hanks, B.S., 1974. Virginia Gilchrist, B.S., University of Alabama; M.S., 1955, 1965; Elizabeth S. Thomas, B.S., Alabama A&M University, M.Ed., Tuskegee Institute, 1945, 1970; Imogene Ritenburgh, B.S., University of Southern Mississippi, 1973; Marie Crenshaw, B.S., Tuskegee Institute, 1967, 1973; Shelby Ellis, Tuskegee Institute, 1972, 1974.
MORGAN Hartselle	C.D. Rutledge, B.S., M.Agr., 1948, 1965; Eddie E. Cannon, B.S., Alabama A&M University; M.S., Tuskegee Institute, 1965; H. W. Houston, B.S., M.Ag., 1954, 1965; Jerry L. Parker, B.S., M.Ed., 1960, 1965; Lucile Hawkins, B.S., University of Montevallo, 1948, 1965; Elouise Lipscomb, 1944, 1965; Thelma E. Gottler, B.S., M.A.T., University of Montevallo.
PERRY Marion	W. O. Hairston, B.S., M.Ag., 1946, 1965; J. A. Bates, B.S., 1950, 1965; Richard E. Smith, B.S., Alabama A&M University, M.Ed., Tuskegee Institute, 1962, 1965. Evelyn Graham, B.S., University of Alabama, 1950, 1965; Dorothy Brice, B.S., Alabama A&M University, 1970; Joyce Richardson, B.S., Judson College, 1958, 1965.
PICKENS Carrollton	Edward N. Graham, B.S., M.S., Mississippi State University, 1960, 1966; Walter D. Powers, B.S., M.Ext.Ed., Mississippi State University, 1966. Theodis Henderson, B.S., Alabama A&M University, 1975. Helen B. Hill, B.S., University of Montevallo; M.S., University of Alabama, 1941, 1965; Lorraine Meeks, B.S., University of Alabama, 1957, 1965.
PIKE Troy	James McLean, B.S., M.Ag.Ed., 1954, 1967. James Aldridge, B.S., 1975; Florence Owens, B.S., Florida State University, 1958, 1965; Dena L. Barnes, B.S., 1973.
RANDOLPH Wedowee	Grady M. Wakefield, B.S., M.Ag.Ed., 1957, 1965; T.F. Burnside, Jr., B.S., M.Ed., 1960, 1965; Theodore Shumpert, B.S., M.Ed., Tuskegee Institute, 1946, 1965. Elaine Evans, Jacksonville State University, 1969, 1970; Paula M. McCollum, B.S., Jacksonville State University, 1970.
RUSSELL Phenix City	C. A. Woods, B.S., 1947, 1965; Donald M. Bice, B.S., Agr., B.S., Ag.Ed., 1970; Mack H. Eldridge, B.S., Virginia State College, 1948, 1965. Betty H. Wilson, B.S., 1971. Angela G. Hughes, B.S., Samford University, 1973.
SHELBY Columbiana	W. M. Clark, B.S., 1937, 1965; J. E. Jones, B.S., 1958, 1965. Marian Cotney, B.S., 1939, 1965; Peggy Prucnal, B.S., Jacksonville State University, 1969.
ST. CLAIR Pell City	Lelias G. Pair, B.S., M.Agr., 1948, 1974; William D. Jackson, B.S., 1946, 1965; J. E. Yates, B.S., 1955, 1965. Aileen Puckett, B.S., M.S., University of Alabama, 1957, 1965; Louise S. Littlejohn, B.S., University of Alabama, 1967.

SUMTER Livingston	B. B. Williamson, B.S., M.Ag., 1946, 1966; Joe E. Lashley, B.S., M.Ag., 1965; Henry J. Spears, B.S., Alabama A&M University, M.Ed., Tuskegee Institute, 1946, 1965; Lee G. Gober, B.S., M.Agr., 1960, 1974. Mildred Ennis, B.S., University of Tennessee, M.S., Livingston State University, 1958, 1965; Gloria R. Steinhilbers, B.S., University of Montevallo, 1970; Theresa E. Threadgill, B.S., Tuskegee Institute, 1957, 1965.
TALLADEGA Talladega	Thomas L. Bass, B.S., M.Ed., 1946, 1966; J. B. Mathews, B.S., 1949, 1965; Curtis H. O'Daniel, B.S., M.Ed., 1965, 1966; Isaac Bias, B.S., Fort Valley College; M.S., Tuskegee Institute, 1973; Wanda P. Jurriaans, B.S., Jacksonville State University; M.A., 1965, 1969. Marie H. Player, B.S., Alabama A&M University; M.Ed., Tuskegee Institute, 1957, 1965.
TALLAPOOSA Dadeville	C. H. Webb, B.S., 1946, 1965; Jerry G. Hanks, B.S., 1970; James L. McGhee, B.S., Alabama A&M University, M.Ed., Tuskegee Institute, 1968; R. W. Thompson, B.S., M.Ag.Ed., 1958, 1965. Margaret Miller, B.S., 1949, 1965; Nelda B. Martin, B.S., University of Alabama, 1971.
TUSCALOOSA Tuscaloosa	Albert Pitts, Jr., B.S., M.Ag., 1952, 1970; James Cooper, B.S., 1948, 1965; B. B. Fields, B.S., Tuskegee Institute, M.S., University of Illinois, 1954, 1965; James C. Howell, B.S., M.Ag.Ed., 1961, 1965; French Sconyers, B.S., 1943, 1965. Elizabeth Stewart, B.S., M.S., University of Alabama, 1945, 1965; O'Neal Massey, B.S., M.S., University of Alabama, 1952, 1965; Jo Ann H. Smith, B.S., University of Alabama, 1970; Peggy L. White, B.S., University of Alabama, 1971.
WALKER Jasper	Robert E. Thornton, B.S., M.Ag., 1954, 1965; W. D. Jones, B.S., M.Ag., 1954, 1965. Jeannette Argo, B.S., University of Montevallo; M.S., University of Alabama, 1942, 1965; Elaine Cole, B.S., University of Alabama, 1973.
WASHINGTON Chatom	D. O. Estes, B.S., 1949, 1965; Thomas E. Fuller, B.S., 1969; Sarah H. Hazen, B.S., 1964, 1965; Patricia Ann Taylor, B.S., University of Alabama, 1968.
WILCOX Camden	Robert C. Farquhar, B.S., M.S., 1949, 1965; Richard E. Cobb, B.S., Tuskegee Institute, 1950, 1968; W. J. Hardy, B.S., 1954, 1965; Solonia E. Reynolds, B.S., Alabama A&M University, M.Ed., Tuskegee Institute, 1949, 1973; Susan Gaston, B.S., 1975.
WINSTON Double Springs	Robert I. D. Murphy, B.S., M.Ag., 1958, 1974; Jean P. West, B.S., University of Alabama, 1972. Clyde Rice, Jr., B.S., 1973.

ENGINEERING EXPERIMENT STATION STAFF

HARRY M. PHILPOTT, A.B., Ph.D., D. D., LL.D., LL.D., LL.D., *President*
 CHESTER C. CARROLL, B.S.E.E., M.S.E.E., Ph.D., *Vice President for Research*
 VINCENT S. HANEMAN, JR., S.B., M.S.E. (AE), Ph.D., *Director*
 WILLIAM C. JONSON, JR., B.S., *Assistant Director*

Dual roles are performed by faculty and staff of the School of Engineering who serve also as personnel of the Engineering Experiment Station.

ENGINEERING EXTENSION SERVICE STAFF

HARRY M. PHILPOTT, A.B., Ph.D., D.D. LL.D., LL.D., LL.D., *President*

GENE A. BRAMLETT, B.S., M.S., Ph.D., *Vice President for Extension and Public Service*

VINCENT S. HANEMAN, JR., S.B., M.S.E. (AE), Ph.D., *Director*

JAMES F. O'BRIEN, JR. B.M.E., M.M.E., *Associate Director*

JAMES R. WILBANKS, B.M.E., M.M.E., *Assistant Director*

A. HENRY AVERYT, B.M.E., M.S.I.M., *Director, Birmingham Office*

ANNE P. JEFFRIES, *Director, New Program Development, Birmingham Office*

OLAN A. HEMBREE, *Administrative Assistant*

LUELLEN NAGLE, B.S.Ed., *Administrative Assistant, Birmingham Office*

Dual roles are performed by faculty and staff of the School of Engineering who serve also as personnel of the Engineering Experiment Station.



ENROLLMENT STATISTICS

Table 1—Enrollment by Classes, Courses, and Divisions

SCHOOL AND CURRICULUM

School of Agriculture

	Freshmen		Sophomores		Juniors		Seniors		5th Year		Special and Unclassified		Totals by Sex	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W
Agriculture Business and Economics (AS).....	22	0	22	0	17	1	22	0	0	0	2	1	85	2
Agricultural Engineering (AN).....	13	0	13	0	6	0	3	1	0	0	1	0	36	8
Agricultural Science (AS).....	16	4	12	1	10	2	14	1	0	0	3	1	55	8
Agronomy and Soils (AV).....	10	0	18	0	14	0	10	0	0	0	1	0	53	0
Animal and Dairy Science (ADS).....	22	11	18	8	36	5	48	6	0	0	8	0	132	30
Biological Science (BS).....	71	44	49	14	74	28	74	22	19	0	19	4	287	112
Food Science (FS).....	0	2	1	1	1	0	3	0	0	0	0	0	4	3
Forest Management (FV).....	74	7	82	5	73	4	68	1	0	0	0	0	298	17
Horticulture (HF).....	7	2	1	2	11	2	2	1	0	0	0	0	21	0
Landscape and Ornamental Horticulture (OH).....	17	13	12	13	18	11	18	10	0	0	1	1	66	48
Poultry Science (PH).....	3	0	1	0	3	0	2	1	0	0	0	0	9	1
Wood Technology (WT).....	1	0	2	0	5	0	4	0	0	0	0	0	12	0
TOTAL Undergraduate.....	256	83	230	44	268	53	268	43	0	0	36	8	1058	229

**School of Architecture and
Fine Arts**

Architecture (AR).....	88	21	49	9	77	9	78	6	42	4	0	334	48
Building Science (BSC).....	67	0	92	0	76	0	94	0	0	0	0	330	
Industrial Design (IND).....	23	3	22	2	25	3	15	1	0	0	0	88	
Interior Design (ID).....	3	23	4	17	4	17	6	14	0	0	0	19	
Music (MU).....	9	22	5	4	4	9	8	0	0	0	0	25	45
Theatre (TH).....	3	14	3	5	3	4	4	2	0	0	0	25	
Visual Arts (VA).....	25	73	27	31	26	33	43	0	0	0	4	113	184
TOTAL Undergraduate.....	218	156	202	75	215	75	238	69	42	4	7	922	383
GRADUATE SCHOOL													
TOTAL (Architecture & Fine Arts)													
												5	6
												389	927

SCHOOL AND CURRICULUM

School of Arts and Sciences

	Freshmen		Sophomores		Juniors		Seniors		5th Year		Special and Unclassified		Totals by Sex	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W
Applied Physics (APS).....	4	0	2	1	3	0	1	0	0	0	1	0	10	1
Chemistry (CH).....	10	2	4	5	3	6	11	9	0	0	0	2	29	9
General Curriculum (GC).....	159	227	55	64	3	1	2	1	0	0	6	0	225	300
Gen. Cur. Art (GAT).....	1	2	1	0	1	1	4	5	0	0	0	0	3	3
Gen. Cur. Biological Science (GBI).....	16	16	6	8	8	8	6	4	0	0	0	0	36	3
Gen. Cur. Chemistry (GCH).....	0	0	0	0	0	0	1	0	0	0	0	0	3	0
Gen. Cur. Comparative Lit. (GCL).....	0	0	0	1	0	0	0	1	0	0	0	0	1	1
Gen. Cur. Economics (GEC).....	0	0	1	0	0	0	0	2	0	0	0	0	3	3
Gen. Cur. English (GEH).....	1	15	1	0	0	1	4	14	0	0	0	0	24	5
Gen. Cur. Foreign Language (GFL).....	4	15	2	15	4	19	2	16	0	0	0	0	12	6
Gen. Cur. Geography (GGY).....	0	0	0	1	5	0	7	1	0	0	0	0	12	3
Gen. Cur. Geology (GGL).....	2	6	2	0	0	0	1	0	0	0	0	0	5	1
Gen. Cur. History (GHT).....	16	6	6	5	8	9	18	4	0	0	1	1	25	2
Gen. Cur. Journalism (GJM).....	18	41	18	22	10	26	15	17	0	0	1	0	50	25
Gen. Cur. Mathematics (GMH).....	13	27	2	13	14	13	16	19	0	0	0	0	63	73
Gen. Cur. Philosophy (GPH).....	2	0	0	0	1	0	5	3	0	0	0	0	9	3
Gen. Cur. Psychology (GPG).....	17	56	9	27	26	25	23	36	0	0	2	0	96	96
Gen. Cur. Political Science (GPO).....	13	10	9	7	21	5	20	10	0	0	0	0	35	6
Gen. Cur. Physics (GPH).....	0	0	12	16	19	0	22	22	0	0	3	0	66	0
Gen. Cur. Speech Communication (GSC).....	13	0	0	1	0	22	19	0	0	0	0	0	44	0
Gen. Cur. Social Work (GSW).....	0	16	5	0	0	3	16	27	0	0	0	0	30	6
Gen. Cur. Sociology (GSV).....	4	21	5	25	19	31	9	34	0	0	0	0	26	26
Gen. Cur. Social Work (GSW).....	4	21	5	25	19	31	9	34	0	0	0	0	26	26
Geology (GL).....	8	0	5	2	7	8	9	2	0	0	0	0	30	6
Lab. Technology (LT).....	5	50	3	26	30	26	11	32	0	0	0	0	136	9
Criminal Justice (CJ).....	39	10	33	16	30	12	25	2	0	0	0	0	127	40
Mathematics (MH).....	1	1	3	0	1	0	12	4	0	0	0	0	19	9
Physics (PS).....	16	5	7	0	4	1	0	0	0	0	0	0	32	7
Pre-Dentistry (PD).....	41	1	12	1	10	3	1	0	0	0	2	0	79	9
Pre-Hosp. Admin. (HA).....	4	1	4	3	5	3	1	0	0	0	0	0	14	6
Pre-Law (PL).....	77	29	57	22	47	11	29	3	0	0	0	0	210	66
Pre-Medicine (PM).....	114	53	50	14	42	11	46	12	0	0	0	0	253	1
Pre-Occupational Therapy (OT).....	0	8	1	0	0	0	0	0	0	0	0	0	1	13
Pre-Optometry (OP).....	0	0	3	0	1	0	1	0	0	0	0	0	10	1
Pre-Pharmacy (PP).....	69	70	43	43	30	17	5	2	0	0	3	1	150	13
Pre-Physical Therapy (PT).....	4	18	2	16	6	3	0	0	0	0	1	1	8	2
Pre-Physical Therapy (PT).....	4	18	2	16	6	3	0	0	0	0	1	1	8	2
Pre-Veterinary Medicine (PV).....	140	80	70	31	65	19	20	4	0	0	3	0	305	2
Psychology (PG).....	0	0	0	1	0	6	18	5	0	0	0	0	21	21
Public Administration (PUB).....	2	5	9	5	16	6	18	5	0	0	0	0	45	45
TOTAL Undergraduate.....	819	771	462	396	427	298	361	241	0	0	39	17	1722	1722

GRADUATE SCHOOL
TOTAL (Education)[illegible]

SCHOOL AND CURRICULUM

School of Engineering

	Freshmen		Sophomores		Juniors		Seniors		5th Year		Special and Unclassified		Totals by Sex	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W
Aerospace Engineering (AE)	0	0	18	2	15	1	9	0	0	0	0	0	42	3
Aviation Management (AM)	0	0	15	0	38	1	57	0	0	0	0	0	111	1
Chemical Engineering (CHE)	0	0	26	0	31	4	21	1	0	0	1	0	79	10
Civil Engineering (CE)	0	0	38	1	72	5	89	3	0	0	2	0	201	9
Electrical Engineering (EE)	0	0	71	1	113	0	123	0	0	0	3	0	310	1
Industrial Engineering (IE)	0	0	16	3	28	3	22	5	0	0	1	2	67	13
Mechanical Engineering (ME)	0	0	51	2	50	1	49	0	0	0	1	0	151	3
Materials Engineering (MTL)	0	0	1	0	3	0	0	0	0	0	0	0	4	0
Pre-Chemical Engineering (PCN)	60	6	24	1	0	0	0	0	0	0	0	0	84	7
Pre-Engineering (PN)	495	37	254	19	0	0	0	0	0	0	0	0	749	56
Pre-Engineering Management (PNM)	52	2	51	1	0	0	2	2	0	0	0	0	103	3
Textile Chemistry (TC)	0	0	0	0	0	0	1	0	0	0	0	0	3	2
Textile Engineering (TE)	0	0	12	2	10	1	14	1	0	0	0	0	36	2
Textile Management (TM)	0	0	0	0	1	0	0	0	0	0	0	0	2	1
TOTAL Undergraduate	607	45	578	36	361	15	387	15	0	0	9	2	1942	113
GRADUATE SCHOOL TOTAL (Engineering)													130 2072	15 128

School of Home Economics

	Freshmen		Sophomores		Juniors		Seniors		5th Year		Special and Unclassified		Totals by Sex	
	M	W	M	W	M	W	M	W	M	W	M	W	M	W
Clothing and Textiles (CT)	0	12	0	10	0	0	1	18	0	0	0	0	1	65
Family and Child Dev. (FCD)	0	52	0	32	0	22	0	39	0	0	0	0	1	152
Family and Child Services (FCS)	1	6	0	11	0	26	0	18	0	0	0	0	1	55
Fashion Merchandising (FM)	1	62	1	32	0	38	0	30	0	0	0	0	2	182
Home Mgt. and Family Ec. (HME)	0	11	0	7	0	11	0	8	0	0	0	0	0	37
Housing and Equipment (HEQ)	0	33	0	10	0	22	0	20	0	0	0	0	2	85
Food Service Admin. (FSA)	0	0	0	0	1	0	1	2	0	0	0	0	3	3
Nursing Science (NS)	0	37	0	16	0	9	0	1	0	0	0	0	3	63
Nutrition and Foods (NF)	0	17	0	14	0	25	0	17	0	0	0	0	6	75
TOTAL Undergraduate	2	231	5	132	2	173	6	153	0	0	1	8	16	697
GRADUATE SCHOOL TOTAL (Home Economics)													8 24	42 739

Table II—Enrollment of Alabama Students by Counties
Fall Quarter, 1975

County	Men	Women	Total
Autauga	85	36	121
Baldwin	151	63	214
Barbour	62	50	112
Bibb	6	5	11
Blount	39	13	52
Bullock	27	17	44
Butler	32	18	50
Calhoun	138	81	219
Chambers	189	115	304
Cherokee	15	18	33
Chilton	35	10	45
Choctaw	12	4	16
Clarke	33	19	52
Clay	39	33	72
Cleburne	12	3	15
Coffee	78	53	131
Colbert	72	26	98
Conecuh	17	10	27
Coosa	14	15	29
Covington	103	68	171
Crenshaw	25	15	40
Cullman	64	36	100
Dale	75	52	127
Dallas	79	63	142
DeKalb	61	28	89
Elmore	82	56	138
Escambia	58	45	103
Etowah	162	94	256
Fayette	21	6	27
Franklin	25	12	37
Geneva	50	33	83
Greene	2	4	6
Hale	21	13	34
Henry	38	22	60
Houston	157	72	229
Jackson	49	32	81
Jefferson	1,165	821	1,986
Lamar	10	6	16
Lauderdale	114	64	178
Lawrence	27	5	32
Lee	1,031	776	1,807
Limestone	45	23	68
Lowndes	31	12	43
Macon	49	57	106
Madison	490	396	886
Marengo	21	29	72
Marion	21	6	27
Marshall	137	82	219
Mobile	280	213	493
Monroe	51	27	78
Montgomery	618	481	1,099
Morgan	147	104	251
Perry	24	13	37
Pickens	15	12	27
Pike	34	16	50
Randolph	59	50	109
Russell	123	89	212
St. Clair	27	13	40
Shelby	63	38	101
Sumter	15	5	20
Talladega	160	80	240
Tallapoosa	144	122	266
Tuscaloosa	52	32	84
Walker	36	17	53
Washington	11	9	20
Wilcox	25	14	39
Winston	14	6	20
TOTAL (Alabama)	7,189	4,858	12,047

TABLE III—Enrollment of Students by States and Territories
Fall Quarter, 1975

State	Men	Women	Total
Alaska	4	4	8
Arizona	4	2	6
Arkansas	19	5	24
California	33	13	46
Colorado	5	3	8
Connecticut	7	8	15
Delaware	4	6	10
District of Columbia	0	1	1
Florida	790	547	1,337
Georgia	835	680	1,515
Illinois	32	22	54
Indiana	30	11	41
Iowa	7	2	9
Kansas	3	1	4
Kentucky	93	36	129
Louisiana	45	23	68
Maine	4	0	4
Maryland	50	12	62
Massachusetts	12	2	14
Michigan	15	9	24
Minnesota	1	6	7
Mississippi	110	60	170
Missouri	20	9	29
Montana	0	1	1
Nebraska	3	4	7
Nevada	0	1	0
New Hampshire	3	2	5
New Jersey	59	14	73
New Mexico	6	1	7
New York	54	20	74
North Carolina	69	27	96
North Dakota	1	1	2
Ohio	50	25	75
Oklahoma	12	4	16
Oregon	2	0	2
Pennsylvania	47	17	64
Rhode Island	5	1	6
South Carolina	53	28	81
South Dakota	5	0	5
Tennessee	292	141	433
Texas	54	29	83
Utah	3	0	3
Vermont	1	2	3
Virginia	90	43	133
Washington	6	3	9
West Virginia	8	7	15
Wisconsin	18	3	21
TOTAL—Other States	2,964	1,836	4,800
TOTAL—All States	10,153	6,694	16,847
United States Territories			
Canal Zone	2	2	4
Puerto Rico	2	0	2
TOTAL—U. S. Territories	4	2	6

Table IV—Enrollment of Students by Foreign Country
Fall Quarter, 1975

Foreign Country	Men	Women	Total
Argentina.....	0	1	1
Australia.....	2	1	3
Belgium.....	0	1	1
Bolivia.....	1	0	1
Brazil.....	3	0	3
Cambodia.....	1	0	1
Canada.....	2	1	3
Chile.....	1	1	2
China (Taiwan).....	41	19	60
Colombia.....	1	0	1
Costa Rica.....	1	0	1
Denmark.....	1	0	1
Egypt.....	2	2	4
El Salvador.....	2	0	2
Germany.....	0	1	1
Guatemala.....	1	1	2
Guyana.....	2	0	2
India.....	17	4	21
Iran.....	19	3	22
Israel.....	4	1	5
Jordan.....	0	0	0
Korea.....	1	0	1
Lebanon.....	0	1	1
Mexico.....	2	1	3
Nepal.....	4	0	4
Netherlands.....	2	0	2
Nicaragua.....	2	0	2
Nigeria.....	2	0	2
Pakistan.....	5	0	5
Panama.....	2	1	3
Philippines.....	10	2	12
Republic of Vietnam.....	1	0	1
South Africa.....	1	0	1
Swaziland.....	1	0	1
Tanzania.....	1	0	1
Thailand.....	7	6	13
Turkey.....	0	2	2
United Kingdom.....	0	1	1
TOTAL—Foreign Countries.....	141	50	191
TOTAL STUDENTS ENROLLED			
Fall Quarter, 1975.....	10,298	6,746	17,044

General Summary of Enrollment

Total Enrollment on Auburn Campus (Credit).....	17,044
Auburn University (Non-Credit Community Service Programs).....	1,897
Correspondence Study.....	500
Clinics, Conferences, etc.....	23,018
Auburn University at Montgomery (Credit).....	3,797
Auburn University at Montgomery (Non-Credit).....	1,241
GRAND TOTAL.....	47,497

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